THE GARDEN JOURNAL

OF THE NEW YORK BOTANICAL GARDEN

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THE GARDEN JOURNAL OF THE NEW YORK BOTANICAL GARDEN

DOROTHY EBEL HANSELL
Editor

May 14, 1959. Spring Garden Tour, lower Connecticut, sponsored by the Volunteer Associates of The New York Botanical Garden.

May 14, 1959. Board of Directors' Meeting of American Horticultural Council at Longwood Gardens, Kennett Square, Pa., preceded by visit to Winterthur, by invitation of Henry F. du Pont, on May 13. Executive Committee meeting, du Pont Hotel, Wilmington, Del., evening of May 13.

May 16, 1959. Pennsylvania Horticultural Society "Demonstration Field Trip," Morris Arboretum, Chestnut Hill —cultivation of azaleas from cuttings to mature plants, and tour of azalea plantings.

May 23, 1959. Flower Show and Meeting of the New York and New Jersey Chapters, American Rhododendron Society at The New York Botanical Garden.

May 27, 1959. Annual Meeting of The New York Botanical Garden.

June 4, 1959, 11 A.M.-5 P.M. Visit to six herb gardens and herb plant sale in Westchester County, New York, sponsored by New York Herb Unit, Herb Society of America for benefit of educational projects, including revision of Herb Garden at The New York Botanical Garden and establishment of adjacent demonstration herb garden. For information contact Mrs. George Haas, Tripp St., Mt. Kisco, N. Y.

June 9, 1959. Rose Day, Brooklyn Botanic Garden.

June 10, 1959. Seventeenth Annual Rose Day at The New York Botanical Garden.

June 10-13, 1959. National Meeting, American Rose Society, Hotel Sheraton, Philadelphia.

June 18, 1959. Reception for students of the Two-Year Courses in Botany and Practical Gardening at The New York Botanical Garden.

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CREDIT FOR ILLUSTRATIONS

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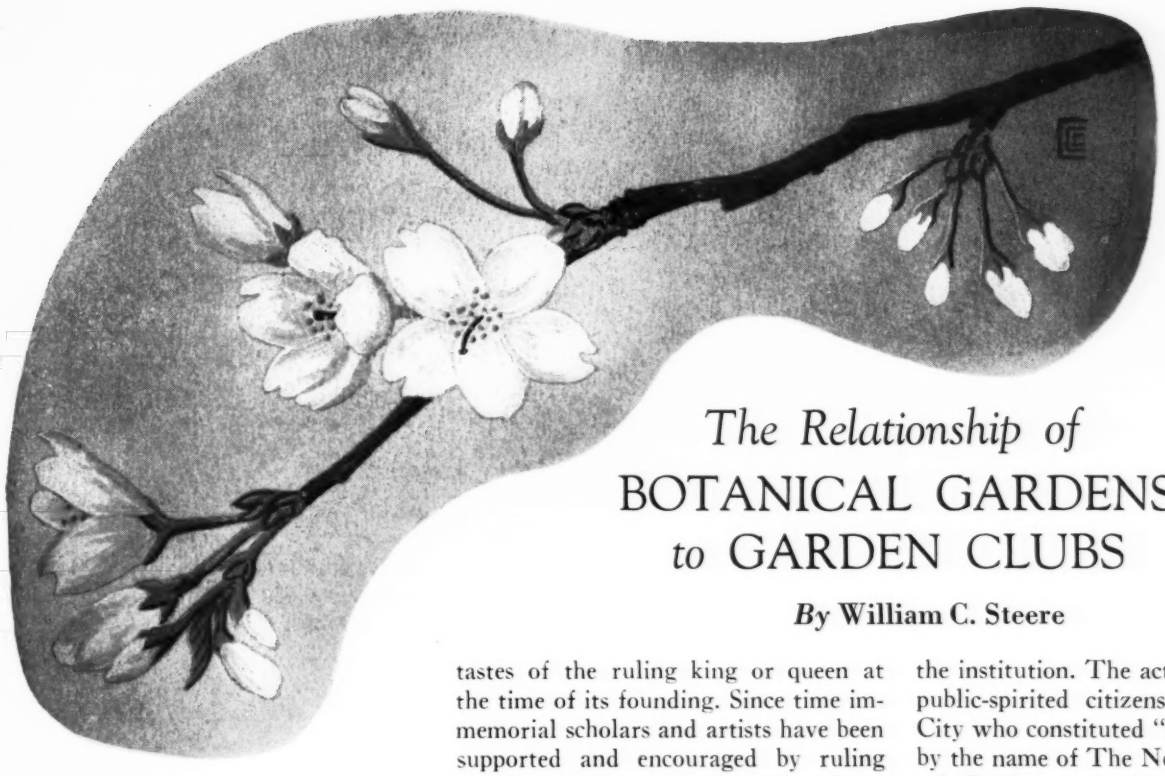

The Relationship of BOTANICAL GARDENS *to* GARDEN CLUBS

By William C. Steere

Talk Given before the Annual Meeting of The Federated Garden Clubs of New York State, Inc., in New York City, March 10, 1959, by Dr. Steere, Director of The New York Botanical Garden.

I HAVE BEEN associated with botanical gardens since my student days and have been using the library and other facilities of The New York Botanical Garden for more than twenty-five years. Until very recently, however, I have never had the responsibility for directing one. This new responsibility has given me a multitude of things to ponder upon, and has raised many questions in my mind. Most important among these questions are "What is a botanical garden?" and especially, "What are the responsibilities and obligations of a botanical garden?"

On examination, we find that many kinds of botanical gardens exist. They took their beginnings in the very ancient past primarily from two sources—the need for collections of medicinal plants by physicians and the wish for beautiful gardens for recreation by those who could afford them. The great botanical gardens of Europe—at Kew, at Berlin-Dahlem, in Paris, in Madrid, in Moscow, in Copenhagen, and many others — are or were royal botanical gardens, designed to please the aesthetic tastes of the ruling king or queen at the time of its founding. Since time immemorial scholars and artists have been supported and encouraged by ruling families, partly to develop the culture of the nation and partly for personal prestige. It was only natural, therefore, that outstanding botanists should gravitate to the royal botanical gardens and establish there centers for botanical and horticultural research.

The first botanical garden in New York, of course, was the Elgin or Hosack Garden of Dr. David Hosack, established in 1801 primarily for the cultivation of his medicinal herbs. Too expensive for support by one individual and engulfed by a growing city, it disappeared, after purchase by the State of New York and granted to Columbia University. Rockefeller Center now stands on its historic site.

The New York Botanical Garden was conceived and founded by a group of Americans who were inspired by the example of the Royal Botanic Gardens at Kew. The bronze plaque at the entrance to the Founders' Room at the Garden has the following message: "Dedicated to those public-spirited citizens who foresaw the importance of Botany and Horticulture in the cultural and scientific life of the city and the nation and founded The New York Botanical Garden."

The New York Botanical Garden was founded nearly seventy years ago, when the Legislature of the State of New York passed an act incorporating the institution. The act lists forty-eight public-spirited citizens of New York City who constituted "a body corporate by the name of The New York Botanical Garden, to be located in the City of New York." I am sure that the reasons for the founding of the Garden as stated then will be of interest to you now. They are as follows: "for the purpose of establishing and maintaining a botanical garden and museum and arboretum therein and elsewhere within or without the State of New York, for the collection and culture of plants, flowers, shrubs and trees, the advancement of botanical science and knowledge and the prosecution of original researches therein and in kindred subjects, for affording instruction in the same, for the prosecution and exhibition of ornamental and decorative horticulture and gardening, and for the entertainment, recreation, and instruction of the people."

Today, The New York Botanical Garden is many things to many people, because of the multiple functions expressed in its founding act. It is well known to botanists over the whole world because of its excellent library, its magnificent collections of living and dried plants, its many excellent technical publications, and its outstanding scientific staff. To professional and amateur horticulturists, the Garden is a treasure house of information, through its library, its collections of plants, and its highly competent staff of horticulturists and botanists. To home garden-

ers and the general public, it is a ready source of information about plants, a place to see garden plants growing, and a place where one who is tired of stone and brick jungles may satisfy his aesthetic needs. Through its courses in horticulture and botany the Garden makes instruction available at all levels in these closely related subjects, and each year our courses increase in their enrollment. Our annual participation in the International Flower Show through special exhibits and in other shows is an example of our extramural activities. Of course, I can't refrain from displaying a certain sense of pride and of pleasure in our beautiful exhibit at the International Flower Show this year—and at the wonderful awards that it received, including the special bronze medal of the Federated Garden Clubs of New York State! In spite of our horticultural successes, however, I am shocked as a newcomer to New York by the small proportion of citizens who show interest in the Botanical Garden; and hope that we can increase substantially the interest of the public.

I came here today ostensibly with the purpose of speaking to you on the topic of the relation of botanical gardens to garden clubs. Needless to say, I have given this topic extremely careful thought ever since I agreed to speak on it—especially during some sleepless moments at night. First of all, I have yielded to the temptation to translate "botanical gardens" into "The New York Botanical Garden." In other words, it seems to me best to deal with specific cases than with generalities, which, although polite, are most difficult to apply.

The New York Botanical Garden has, since its inception, offered its facilities freely to garden clubs. However, a great deal more remains to be done. Through lack of funds and perhaps, although I dislike to suggest it, through less than an enthusiastic approbation of the idea of helping garden clubs and their members in their horticultural enterprises, in some past years, the Garden has fallen short of full success. Other botanical gardens in more favorable climates are doing a better job, and my own visits to them have given me a much better idea of the full potential of The New York Botanical Garden for leadership in these areas. For example, the Santa Barbara Botanic Garden, perhaps one of the most beautifully situated in North America, has as its specialty the growing for public inspection of all the native trees, shrubs and flowers of California. A single-minded directive of this sort is much easier to follow and to develop than the many-headed mission of The New York Botanical Garden. The director of the Santa Barbara Botanic Garden is not expected to do botanical research or to train graduate students in botany — or to give evening courses in botany and horticulture to adults interested in plants and in gardening. The orderly bringing together of the native plants of California and their display in a beautiful setting is quite enough — and a great success, indeed.

One of the most interesting and potentially most successful botanical gardens of California is the Los Angeles State and County Arboretum at Arcadia, just east of Pasadena. Although very new, this institution has already developed a momentum that will certainly make it one of the significant and important horticultural centers of the West. The large experimental plantings of South African and Australian trees and shrubs will produce many plants suited to the rigorous climate of southern California, and continued collecting in semi-arid subtropical climates of the world will bring into cultivation in California many beautiful and desirable plants not now known there. The obligation of botanical gardens to test and to introduce new plants into cultivation, I accept without question. This obligation can be followed up by The New York Botanical Garden with great benefit to garden clubs and to their members. The explorations of T. H. Everett in European gardens have already turned up plants of interest to gardeners, as shown in his articles in The Garden Journal of The New York Botanical Garden, describing many plants heretofore unknown in the United States. Some of his more interesting discoveries have been distributed to members of The New York Botanical Garden and are to be seen growing in gardens throughout the whole greater New York area. However, a more active program of plant introduction and leadership in testing and distribution are most certainly called for, and all of you will eventually benefit from such a program.

To return to the Los Angeles State and County Arboretum—a further activity that met with extraordinary success was the establishment of a series of demonstration home gardens, thanks to the sponsorship and generous support of Sunset Magazine, in itself a spectacular success story which time does not permit telling here. Many firms and organizations contributed materials and ideas to the demonstration home gardens, so that one, as he views these gardens, may obtain ideas on numerous types of paving, of fences, of roof structure, of lighting. Each of the four demonstration gardens illustrates a multitude of ideas rather than a single approach to garden layout and design. Moreover, they were designed to demonstrate hundreds of new and old building materials, as well as new plant introductions and many old plants in new settings.

The four demonstration gardens selected in a competition show the ultimate in thoughtfulness and cleverness, and were planned for four fictitious families, who seem more and more real as one spends more time examining the gardens.

The four gardens, bursting with ideas, are the following:

First, an easy maintenance garden, to get its owners away from plant-sitting—the need for care on any daily or weekly schedule. This family owns a boat and requires a garden that can get along for a few days at a time without attention. The landscape architect called this an all-succulent garden, suitable for entertainment and enjoyment, and yet which is a non-wilt garden that can be neglected on occasion without damage.

Second, an entertainer's garden, to take care of a party of twenty couples with ease and a bit of luxury. In such a garden, the luxury doesn't come from the materials and structures as much as it does from spreading out the activities of the crowd, who can gather and separate—from terrace to deck to firepit. Moreover, each part of the day and night sets its own party-time stage; an evening party around the fireplace, an afternoon party on the shady deck overlooking the pool. The roofed terrace gives a place to move to for shelter when the wind blows.

Third, a family garden designed for the stresses and strains put upon it by

several children and two dogs, a situation familiar to many of you, I am sure. Although this garden will never win a blue ribbon in a flower show and contains no unusual rare or exotic plants, it does furnish color, cut flowers and a few vegetables. The planting is protected by housing it in a raised bed, which regulates speeding wagons, tricycles and running feet. If a few plants are uprooted by children hunting lost balls or dogs burying bones, this is only par for the course.

Fourth, a plant collector's garden designed for people who collect plants just as others collect stamps or records, and who like to experiment with them. Between a greenhouse and a lathhouse is a "puttering room," where special plants can be displayed, tended to, or just admired. Outside is a garden filled with choice and special plants, well placed and well labelled. From this garden may very easily develop the eventual nucleus of a new botanical garden!

The example of the Los Angeles State and County Arboretum cannot be followed exactly or even imitated in the climate of New York. If you think that I am making invidious comparisons, let me tell you an experience of just a year ago, when we were living on the campus of Stanford University, some thirty miles south of San Francisco. During a prolonged rainy period, so great a volume of water rushed down the east slope of the coast range toward San Francisco Bay that it threatened to flood some of the professors' homes on the campus. With water rushing in one end of our semi-circular driveway and out the other with the velocity of a mountain torrent, I went out to see what progress was being made in diverting the flood and found Stanford's extremely able business manager himself directing operations. He had just heard of my decision to move east, and under the pressure of the emergency, he suggested tersely that we move The New York Botanical Garden to the nine-thousand-acre Stanford University campus, where plants can really grow! All this while standing amidst a flood in his hip boots! Since my friends may accuse me of talking like a Californian, I should make the point that perhaps there is a greater challenge in and something much more sporting about raising plants in the less euphoric climate of New York than there is in California.

In conclusion, I wish to tell you that we of The New York Botanical Garden plan to move ahead with force, vigor and enthusiasm to new ideas, new concepts, and new successes. We recognize our historic obligation to demonstrate leadership. We hope to augment our progress in botanical research and to develop still further our status as a cultural force in the fields of horticulture and gardening in the local and national picture. All these developments will make The New York Botanical Garden of greater importance and greater helpfulness to garden clubs such as yours. In view of this increasing tempo in our activities, I shall leave you with one question: "What can you do for The New York Botanical Garden that will make us more helpful to you?"

"LOST WORLDS" of VENEZUELA

An audience of broad interests in the tropics—in plant exploration, in scientific and industrial developments — gathered in the auditorium of the French Institute Building on Wednesday evening, March 18, 1959, at the Invitation of Charles B. Harding, President, and the Board of Managers of The New York Botanical Garden.

Mr. Harding, after welcoming the distinguished guests, called on Dr. William C. Steere, Director, to introduce Dr. Bassett Maguire, Head Curator and Coordinator of Tropical Research at The New York Botanical Garden. Dr. Steere said in part:

Since its doors first opened sixty years ago, The New York Botanical Garden has encouraged botanical exploration of tropical America, and, as a consequence, staff members have published important monographs on the plants of Puerto Rico, Bermuda, Jamaica, Cuba, the Bahamas, and elsewhere in tropical America. Beyond the fundamental scientific importance of gaining basic botanical data, man further owes to his civilization, on a purely cultural basis, the obligation for making an inventory of all plants and of their potential usefulness to him.

Dr. N. L. Britton's departure every midwinter for some Caribbean paradise, accompanied by his wife and several fortunate colleagues, must have occasioned many good-natured jokes—jokes because of his obvious escape to a more comfortable climate during the winter, and yet good-natured because everyone recognized that this is the best collecting season. When the speaker of the evening sets forth on one of his missions of botanical exploration in the Guiana Highlands, however, there is no joking. Although his colleagues envy him his unprecedented scientific opportunity to explore new worlds, they also know full well the arduous travel, the precarious life and the painful dangers to which he must subject himself—samples of which you will see in his film. A veteran leader of some twenty major expeditions to Surinan, British Guiana, Venezuela, Brazil and Colombia, he has made himself one of the present-day "greats" among botanical explorers.

Our speaker has also achieved a high measure of distinction in still other major areas, as a productive researcher and scholar, and in his long and successful teaching career, first at the University of Georgia, then at Cornell University and Utah State College, and now as a member of the graduate faculty of Columbia University.

Dr. Maguire gave the following brief introduction and then a running commentary as his superb color film, that telescopes the highlights of fifteen years of exploration and adventure in the "Lost Worlds" of Venezuela, was thrown on the screen:

This field work in the American Tropics has held two principal objectives; the first being to make plant inventory of the vast tropical rain-forest of South America north of the Amazon River and east of the Andes Mountains. We use the term "inventory" in its usual connotation, that is, to find out what plants grow there, and roughly how much of each kind there is. All of you recognize this as a primary procedure in dealing with and effectively using any commodity. The second objective, and one of profound scientific significance, is to learn more and more about the patterns of and underlying causes of distribution and evolution of plants on this particular part of the earth's surface. In the American Tropics, where the vegetation is the most complex, diversified and abundant of any continental area in the world, that job is not simple. Generations of bot-

anists before us have dealt with the problem; generations of our successors will not exhaust them.

Many collateral interests occupy attention on our explorations; these chiefly are the taxonomy and classification of the kinds of plants as they occur in the tropics, their possible usefulness to mankind as sources of timber, drugs, wood pulp, latex, gums, fibres, and food; as possible indicators of mineral deposits that lie below the surface of the soil; as wild species that show possibilities of becoming attractive ornamentals and, lastly, the usefulness that native plants have in the primitive cultures of the indigenous forest Indian.

The subject with which our films deal tonight is an extraordinary flora that occupies an equally extraordinary landscape. This landscape forms a great sigmoid band more than a hundred—sometimes two hundred—miles broad, and more than a thousand miles long, lying between the greatest of all rivers, the Amazon on the south, thus nearly touching the equator, and the mighty Orinoco on the north, stretching from the interior of British Guiana across southern Venezuela and northern Brazil to the base of the Andes in Colombia and Ecuador.

I should like to make brief comment on the physical characteristics of this fascinating region, because its form, topography and history have an important bearing on its flora. The terrain is dominated by many, perhaps several hundred, tabular mountains, composed of more or less horizontal, usually quartzitized sandstone or associated sedimentaries; mountains — some of great size—ringed by high vertical cliffs, and isolated from one another by an intervening plateau or low-lying rain-forest, the jungle land of South America. These are the "Lost Worlds" of popular fancy. At base they rest upon the crystalline country or original rock of great age, permanence and relative stability, termed by geologists the Guayana Shield. The table mountains of the "Lost Worlds" represent only remnants of a once enormous lens of sandstone that was thought to have been laid down in shallow seas much more than a hundred million years ago. After elevation, over the intervening millions of years, attrition of erosion has removed most of the mile-thick layer of

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INSTANT BONSAI

By **Marjorie Wihtol**

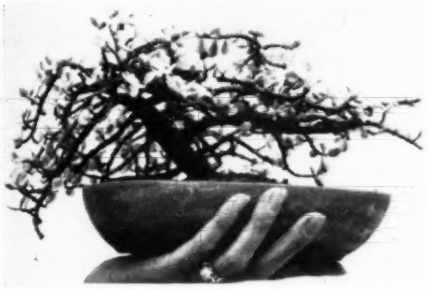
Marjorie (Mrs. Karl) Wihtol has truly a "green thumb" and raises a varied collection of plants in her garden and glasshouse at Middletown, New Jersey.

LIKE LOVE, bonsai is sweeping the country. This adopted art, or addiction, has been practised for a number of years in California and now, even as the fire-ants creep northward, bonsai, bless it, is coming steadily east. The International Flower Show has begun to include classes for these little plants and so have some of the smaller country shows such as those at Morristown, New Jersey, and Greenwich, Connecticut; and the Arnold Arboretum and the Brooklyn Botanic Garden cherish important collections of aged specimens. There is a Bonsai Club of Cleveland; and one of the very few oriental shopkeepers in New York, who sells imported bonsai pots, blames his constant shortage of stock on a group of Baltimoreans who deplete it.

"The word 'bonsai' is loosely translated as 'dwarf tree' or 'potted dwarf tree'". This is the opening sentence in a useful and attractive little book published by the Japan Travel Bureau in 1951 which, until recently, was one of the few works on this subject available in English. For the purpose of this piece I need a legitimate definition of "bonsai" without the word "tree", and happily there is one in a Japanese dictionary. According to this authority, the word "bon" means a tray, server or platter, and "sai" means cultivation. Hence bonsai, pronounced "bone-sigh," means cultivation in a server. That is a big help, for it leaves us Americans free, in our funny lamp-making way, to serve up all kinds of botanical and horticultural whimsies in anything from a bean-pot to an old dog-show trophy and remain lexicographically honest in calling them bonsai. To go further with the dictionary . . . this time a Japanese-English one . . . we might suitably term some of our quickie efforts "giko-bonsai", for "gi" means "imitate" and "ko" means "old", and the two together make the Japanese word for "pseudo". And begging your patience for just one more hassle with definitions but this time in English; what is a tree? Dr. Liberty Hyde Bailey called it a "woody plant that produces one main trunk and a distinct head". Messrs. Funk and Wagnalls are more demanding and insist that a tree be from ten to three hundred feet tall. But let us go along with Dr. Bailey, for there are many woody things that form a distinct trunk and head that aren't exactly redwoods.

Ancient, thrifty-rooted trees have been gathered for centuries by the Japanese from high, wind-swept crags, tended minutely in elaborate, glazed containers and handed down through generations, all in keeping with the antiquity of their culture and the painstaking

qualities in their natures. Let us take what we will of this historic art and adapt it to our own materials, civilization and neurons. For what venerable Occidental-Republican board-chairman, mulched in leather in the Union League Club window, could rest easy that his daughter's ulcer-bound offspring would pause daily on a headlong dive for the 7:50 to water the aged conifer that his sire had dug on the Donner Summit



Portulacaria afra, this succulent decided to be a bonsai; the plant, eight years old, is in a "home-made" container.

back in '69? No! No! — this kind of thing is not native to the American character. We want to enjoy them now, and a lot of us who love bonsai have put on a lot of growth-rings ourselves and are running out of future.

So to do it more in keeping with our funny tribal mannerisms, let us go into the woods, a friend's yard, or along country roads where digging is permitted, find a plant of a kind and shape that suits us, and put it into such domestic ware as we have that will hold it and nourish it. In the January-February 1957 issue of The Garden Journal — and, of course, you keep back numbers—there is an article and photograph of a pair of roadside junipers cultivated in the top of an old iron stove, and right fetching they are.

Imported bonsai pots are devilish hard to find and, once found, even more devilish expensive. The purchase of a twelve-inch rectangle in that lovely cholocate ware does dreadful things to a five-dollar bill. Small nests of three or four beautifully glazed pots do the same, and soon the inmates are going to outgrow these tight quarters and then another and larger expenditure must be made. Sightly less dear, but easier to come by, are containers of various sizes and shapes poured to order by local ceramists, either professional or hobbyist. Plaster molds of salad-bowls, ash-trays and many kinds of oval, square or free-form containers produce suitable and attractive ware. It is important to have them poured thick in order to withstand freezing. Drainage holes should be cut while the slip is still damp (the top of a lipstick is a good tool for this). This is a pity, as it renders the pot useless for anything but planting . . . unless, of course, you can make an arrangement with the boy whose thumb saved Holland from flooding. Glazing requires two firings, more $, and destroys porosity; if the natural color of the clay is unattractive, fast-drying plastic paint or even shoe-polish can be used to create various shades and effects. I myself own a quarter of a kiln which travels from cellar to garage in the neighborhood, blowing fuses and setting fires with dismaying regularity; this isn't recommended to anyone who knows as little about ceramics as I do. At any rate, I have arrived at the conclusion that there is no inexpensive way to pot a bonsai well, with primary regard to the health of the plant, other than to put it into an ordinary American azalea-pot or bulb-pan. And why not? Likewise, if we are not of a mind to buy copper wire and have it specially heat-treated to hold a given shape and force our treelets into tortured form, let's not. A pair of manicure scissors can create many effects, even topiary and espalier.

Above, twenty-one year old *Pinus thunbergi* from Tokyo is planted in a salad bowl.

Right, *Widdringtonia schwarzi*, four years old, is growing in a "home-made" container.

The photographer's son, Marko, a young Japanese-American, holds a small chamaecyparis. Next to him is *Chamaecyparis lawsoniana* var. *nidiformis;* in the foreground, *Pinus thunbergi;* in the background, *Widdringtonia schwarzi.*

I must say I love the bonsai look . . . that leaning blow-me-down effect. But I like it just to happen. In our greenhouse there have been a number of plants which suddenly, left to their own devices, just were bonsai. Slowly they had taken on the right attitudes, displayed roots atop the soil and bent around in a most distinguished manner. When I took the hint and moved them into flatter containers, slightly off-center, tilted a little and snugged up to a stone or bit of driftwood . . . immediately and delightfully they were bonsai, and never mind that ten to three hundred feet. By projecting myself tinily into the scene, in the Oriental manner, the illusion was fine. Not one of the plants was over five years old, and some were not trees by anyone's definition. A four-year cutting of "honey-bell" *(Mahernia verticillata)*, described in HORTUS as a sub-shrub, suddenly took on the right look a while back, produced enormous rheumatic roots, and hung itself over the pot like a do-it-yourself shampoo. As a conventional pot-plant it had been a dud, but moved to a flat dish it gained character and went on blooming to boot. A forgotten and tiresome succulent called *Portulacaria afra*, which nourishes elephants in its native spot, did the same, and now it is a valued piece.

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THE RHIZOMATOUS BEGONIAS

By Mary Ellen Ross

Continued from the March-April issue

Mary Ellen (Mrs. C. Ervin) Ross has had a lifelong interest in plants, but especially in begonias and pelargoniums.

In recent years, thanks to the Mexican expeditions of the noted plant explorer, Thomas MacDougall, many a new species has been introduced which has created a hybridizer's paradise. One of the first MacDougall introductions, *Begonia mazae,* was sent to Mr. Ziesenhenne to be distributed in 1947. *B. mazae* does not have the typical thickened root-stock, but its foliage and flowering habits are of the rhizomatous type. It is semi-upright in growth and distinguished by the dark irregular marks on the margins of its leaves, which are small, ovate, pointed and of a satiny blackish green. The red-brown color under the leaves sometimes gives it a bronzy appearance. Mr. Ziesenhenne quickly went to work with *B. mazae* and within a year introduced the famous black begonia, 'Joe Hayden,' which he produced by crossing *B. mazae* with 'Reichenheimi.' It has a neat habit of growth and star-shaped medium leaves which are blackish brown with a satiny sheen and contrasting yellow veins. As it produced seed freely, seedlings of 'Joe Hayden' were soon put on the market. Most of them came true to type, but it so happened that some of the seedlings sold as 'Joe Hayden' were smaller leaved and without the regular star-shape. Soon confusion developed as to what 'Joe Hayden' was, as two different begonias were being sold under the same name. To straighten out this dilemma, it was generally agreed that this newcomer, without the star-shaped leaves, would be called 'Joe Hayden, Jr.'

Begonia 'Stitched Leaf' is similar to *B. mazae,* but more upright in growth. Leaves are of a satiny bright green with black markings on the margins. In searching for information, I find EXOTICA lists this as *B. mazae viridis* 'Stitchleaf,' which leads me to believe that 'Stitchleaf' is a nickname and that it is a species introduced at the same time as *B. mazae*. Both *B. mazae* and 'Stitchleaf' bear interesting clusters of small white blooms, which are speckled dark pink.

In 1948 MacDougall sent from Mexico another top-rating begonia which Mr. Ziesenhenne named *B. boweri,* in honor of Constance Bowers who has contributed many lovely hybrids to the begonia world. This black-edged, small-leaved begonia, with striking dark hairs, soon was nicknamed the "eye-lash" begonia. It quickly became the darling of all begonia lovers, and as it crossed readily with other types and produced seeds freely, Begonia hybridizers all over the country went mad over the types of seedlings that developed. As *B. boweri* was considered especially small growing, compared to other rhizomatous types, a whole new race of miniature begonias developed.'Zee-Bowman,' which appeared in 1951, is reported to have been the first *B. boweri* hybrid. The small hairy green leaves are prettily decorated with silver. Its parentage and origination I do not know at this writing.

Outstanding among the new *B. boweri* hybrids is 'Maphil,' produced by Mrs. Mabel Walker and introduced in 1952. The name 'Maphil' was coined from her first name and her husband's first name Philip. This was a chance seedling and to look at this gorgeous beauty, so different from the other begonias, one wonders just what the other parent could be. 'Maphil' has a beautifully lobed leaf with an unusual pattern of chartreuse-green outlined with deep brown markings which surround the veins and margins. The overall texture of the leaf is velvety with long eyelashes on the leaf margin, typical of *B. boweri.*

Following 'Maphil,' 'Spaulding' was introduced by Mrs. Louise Schwerdtfeger. She produced this hybrid by crossing *B. boweri* with *B. hydrocotylifolia* and named it for Stanley Spaulding. 'Spaulding' is a low-growing, creeping begonia with small, rounded, yellow-green leaves with darkened areas around the veins. It is much stronger growing than either of its parents and makes an excellent house plant.

In May 1953, Della MacLanahan introduced three lovely hybrids, which are among the most popular of the *B. boweri* hybrids. They are 'Bow-Arriola' with round leaves and pretty bronze markings, smallest and perhaps most compact of the *B. boweri* hybrids; 'Bow-Chance,' a chance cross producing bright chartreuse-green leaves with chocolate markings on wavy margins that have the typical eye-lash hairs; and 'Bow-Nigra,' a *B. boweri* and *B. heracleifolia nigricans* cross. This is perhaps the prettiest of this group and very similar to 'Sunderbruchi,' the "lady finger" begonia described previously. It has the same dark deeply-cut leaves, but is much smaller growing and compact, a fine improvement over the large sprawly 'Sunderbruchi.' 'Beatrice Haddrell,' a favorite seedling developed by Ruth Merry, is another *B. boweri*-'Sunderbruchi' cross which I do not have in my collection. I have seen it, however, and as I remember, it is similar to *B. boweri nigra* in shape but of different coloring. The species, *B. boweri major,* is also in my collection; this is a plain green-leaved *B. boweri* type. It is a lush grower and very easy to handle. There are many other fine hybrids of *B. boweri,* but as I do not possess them, I dare not try to describe them. Their names and descriptions are alluring and despite the fact that my allocated space for this group is crowded, they will, no doubt, be added to my collection.

While on the subject of dwarf rhizomatous, I must not forget that one of the six oldest known begonias introduced by Plumier in 1690 was *B. rotundifolia,* an adorable dwarf species with round, glossy, light green leaves.

Another cute miniature of recent years is *B. aridicaulis* introduced from Mexico by Mr. MacDougall in 1952. It reached Mr. Ziesenhenne as a tiny dried stem which he almost discarded; but on second thought, he put it on the propagating bench where it grew and flourished. Hence he named it *B. aridicaulis,* which means dried stem. The leaves are light green with lighter veins. Some leaves have a little red underneath. Although the plant is apt to be a little sprawling, it is, in general, compact and easy to grow. When left undivided, it becomes very bushy but seldom grows more than six inches tall; it is well suited to a terrarium.

Of recent introduction are two much-

(Continued on page 100)

REBLOOMING IRIS

By Edwin Rundlett

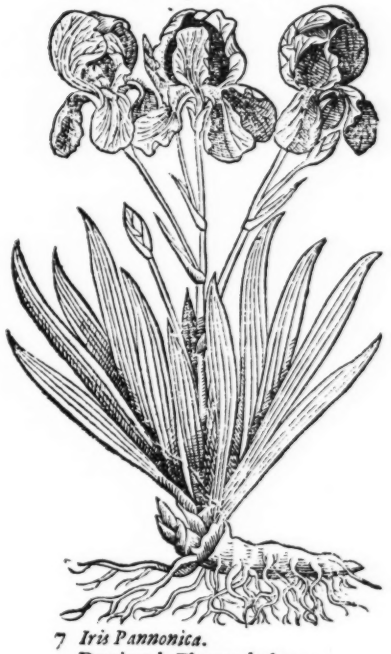
Edwin Rundlett has been Horticulturist of the New York City Department of Parks since 1937. He is the garden page columnist for the "Staten Island Advance," member of the American and British Iris Societies, a director of the Median Iris Society. He grows and breeds beautiful iris in his garden on Staten Island. Four of his tall beared originations, 'Ken', 'Mary Ella', 'Whirling Girl' and 'Inner Light' he sent to the collection at The New York Botanical Garden for the benefit of the American Iris Society meeting in 1961. He has also introduced one reblooming iris, 'Double Date'.

GARDENERS EVERYWHERE crave the unusual. Flowers of exceptional types, or those blooming at odd times and places, draw attention and win admiration. Good gardeners know what happened to the old, June-blooming rose. Today, thanks to tireless efforts by breeders, roses can be enjoyed right through the growing season. The same can be true of the bearded iris, though assembling them takes some skill.

Little has been written on the subject of reblooming or remontant iris. Few catalogs list them, yet there is a great and increasing demand for dependable varieties. When their traits and cultural demands are better known, use will increase and disappointments will be few.

Reblooming iris are extremely regional in their performance. A variety that wins high praise in one place will often sulk miserably or even rot away in another not many miles off. Perhaps the greatest deterrent has resulted from the fact that the most complete and colorful catalogs of iris are issued in the mild climates of the Pacific Coast. Numerous varieties that rebloom dependably there will fail elsewhere, or even at higher elevations along that coast. Buyers whose hopes are dashed, soon stop buying, and spread word around that rebloomers are but a myth. They aren't. They are here. There will soon be many more of them. Quality is improving, too. Scores of breeders of the American Iris Society are busily daubing pollen and spreading information about the culture of this class of iris.

Breeders have had their difficulties too, as the bearded iris that they have



5 *Iris Biflora.*
Twiſe flowring Flower de-luce.

7 *Iris Pannonica.*
Portingale Flower de-luce.

been using as parents are of very complex ancestry. When working with the modern tall bearded sorts, the Mendelian law is of little or no help, though the reblooming trait is definitely hereditary. Gardeners are hardly interested in the reasons for this complexity, but beginning breeders should be warned that some of the most dependable rebloomers for cold climates are those in the intermediate class, and are sterile, or nearly so. Line breeding of true tall bearded rebloomers that perform well in the climate of the breeder, offers the greatest promise. Those wishing to extend the range of reblooming iris northward, might do well to gain hybrid vigor by interspecies crossing. Some success has been achieved by using pollen of dwarf iris of *Iris chamaeiris* type on modern tall bearded iris varieties that show exceptionally rapid increase.

When one realizes that reblooming iris have been sought by gardeners since ancient times, it becomes clear that progress has been difficult. The earliest record that the writer has found on the subject is quoted here for general interest. It is from Gerard's *Herball*, published in 1597, and is illustrated by a picture of *Iris biflora.* The caption reads, "Twice Flowering Flower de-Luce," a name given because "in Autumne (it) flowereth againe and bringeth foorth like flowers". Judging by the picture, the writer believes that this was a derivative of what is now known as *Iris aphylla,* a native of eastern Europe. William R. Dykes, the outstanding English authority on iris, has reported a reblooming form of *Iris aphylla* in England, but efforts to produce another have failed. Opportunity knocks here. This may be a case of hybrid vigor; a cross between *Iris aphylla* and a tall bearded or a dwarf bearded iris.

But our gardening readers must not be led too far afield. These want to know what can be had, where obtainable, and how they should be grown. To learn these facts the American Iris Society has encouraged members engaged in this effort to correspond with each other in what are called "Round Robins". These are correspondence circles of about ten members; each circle has a director who is in touch with other directors. Each person in a circle "Round" in turn writes a letter about his iris hobby, adds it to the packet of letters, removes his old letter, and forwards the packet to the next on the route list contained. Thus it goes 'round and 'round endlessly. Latest information is in this way disseminated long before printers get it.

The following information was collected largely through "Robins". If there is any literature on the subject other than a few paragraphs here and there, the writer has not found it. Such paragraphs have proven of little value in areas where winters are other than mild.

This matter of severity of climate and the adaptability of reblooming irises to any particular climate are of tremendous importance. Large sums of money have been wasted in buying varieties unfit for the climate in which they are to be grown. Rot and disillusionment follow. So a sorting-out process is needed. This is more true with reblooming irises than with other types, as any hindrance at all in the rapidity

of development may delay the fall blooming until frost intervenes.

There are three general classes of reblooming iris to consider. First there is the warm-climate, evergreen type whose second or third flowering comes in winter rather than in the fall. People east of the Rockies, except in the Far South, deplore the fact that these were ever termed rebloomers or remontants; yet there is little that they can do about it other than to urge the catalog makers to state very clearly which sorts are winter bloomers and which are not. A change in this direction was noted in 1958, and those responsible are highly commended.

Here are a few in that category:

'Aahme', orchid-pink
'Arcadia Buttercup', yellow
'Bel-Air', ruffled blue-violet
'California Pink', orchid-pink
'December Royalty', royal purple
'Joseph's Mantle', golden-buff, washed and bordered with red-brown
'Orchid and Flame', orchid with flame-colored beard
'Pink Pinafore', pink plicata
'Russian Bronze', tawny yellow standards, maroon falls
'Sally Ann', clear light yellow
'Springtime Madonna', cream with gold edge
'Technicolor', mahogany-red
'Tournament Queen', fuchsia-colored

Next comes the class of tall bearded iris that blooms in the spring and again in the late summer or early fall before frost, in moderately severe climates. Yet to be found are dependable rebloomers for the severe climates, such as central New York, Wisconsin, the Dakotas, Montana and Wyoming. Breeders are working on that problem. Generally speaking, the varieties that perform well in the moderately severe climates are shorter than those listed above, and more nearly deciduous. Also there is considerable room for improvement in color clarity, but this can be remedied.

Here are some of the better varieties in this class:

'Autumn Afternoon', standards apricot, falls pinkish lavender
'Autumn Snowdrift', mostly white, light veining of lavender on falls
'Autumn Sunset', two-tone bronzy pink
'Autumn Twilight', golden-cream standards, orchid falls
'Double Date', bright clear yellow self, branching to the ground
'Fall Primrose', primrose-yellow
'Gibson Girl', mulberry stippling on cream ground
'Green Dragon,' olive-green blend, stems twisting
'Guiding Star', bright-yellow self of good form and branching
'July Beauty', two-tone blue-violet
'Menominee', pinkish buff
'Mishawaka', yellow self with gold veining at haft
'Nappanee', standards cream with pink flush, falls red-brown
'October Gold', pure gold
'Polar King', white with a bit of veining at hafts
'Potawatomi', mahogany-red
'September Sparkler', light blue standards, falls deeper and blue veined
'September Sunshine', standards butter-colored, falls deeper, but shading to light at edges.

Now let's consider the third class that has perplexed breeders for many years — the intermediate rebloomers. Among them are found those that have the widest geographical range of usefulness. They are intermediate between the tall beardeds and the dwarfs both in stature and in season of bloom. Their beauty lies in the floriferous clumps rather than in individual stalks. Branching is often totally lacking in the stalks. There is a long season of bloom and considerable resistance to damage by light frosts. Alas, many of them are sterile, or nearly so. But until cytological studies are made to determine chromosome counts, it would be unwise to say that all are poor parents. In most cases, both tall bearded and dwarf chamaeiris-type dwarfs are involved in the immediate parentage. Some of the older breeders erroneously termed the chamaeiris dwarfs pumilas, as was the custom in their home sections. It is now known that the true pumilas are quite different. But these things are of more interest to breeders than to gardeners.

Here is a list of the more popular intermediate reblooming irises:

'August Waves', two-tone light blue with heavier veining in blue
'Autumn Elf', standards blue-white, falls blue with deeper veining
'Autumn Queen', white, very pure
'Crimson King', purplish red
'Dorcas Hutcheson', standards light blue, falls pansy-purple
'Eleanor Rossevelt', deep violet with white beard, very popular
'Far South', yellow with brown hafts
'Sangreal', bright yellow with some streaking
'Southland', golden-yellow
'Surefire', chartreuse-yellow
'Ultra', blue bitone
'White Autumn King', white

Passing mention should be made of the few existing dwarf reblooming iris. Breeders should be encouraged to create a great many more, as dwarfs are beautiful at any season. They have been neglected. The best known of these is 'Lieut. de Chavagnac', a rich purple. 'Papoose' is a tiny dwarf with buff standards and mahogany-red falls, and is a good parent. 'Jean Siret' is a somewhat streaked yellow of the same size. 'Sound Money', a golden-yellow, sometimes reblooms.

Those American breeders who have made the greatest contributions to the reblooming iris class are mentioned to give credit where credit is due. Sass Brothers, of Nebraska, did much pioneering work, but they no longer breed iris. The same can be said of Horace M. Hill, of Kansas. Still living and able to advise gardeners in regard to varieties suitable to their own climates are Dr. G. Percy Brown, Central Village P. O., Mass., and Barre, Massachusetts; Charles Wise, Wakarusa, Indiana, cooperating with E. G. Lapham; Lloyd Austin, Placerville, California; and Tom Craig, Escondido, California.

Having acquired properly selected varieties, it is still possible to fail to get the expected reblooming if improper culture is given. Here are the essentials, the object being to keep them growing vigorously all summer, rather than to allow them to go into a rest period.

1. Adequate water is necessary all summer, and poor drainage is to be avoided. Raised beds are best.
2. Fertile soil is essential. Most soils require a feeding of a single handful or so of a balanced general purpose chemical fertilizer to each clump soon after spring blooming. It must be soluble fertilizer, not slow-acting organics.
3. This class needs division more often than standard types. Once in two years is about right in the eastern states. On the West Coast many growers divide every year. Space about two feet apart when dividing; plant shallow.
4. Full sunlight. Lack delays blooming or prevents it.
5. Competition with weeds, or with the roots of trees and shrubs, is to be avoided.
6. Control of diseases and pests must be practised
7. Spent stalks and brown foliage in late fall and again in early spring are to be removed.

If this looks like too much trouble, it should be remembered that rewards are in proportion to the efforts expended.

HEMEROCALLIS *and* Stedman Buttrick

By Ruth Peirce Merry

Hemerocallis 'State Fair' (Buttrick).

Ruth P. (Mrs. Percy I.) and her husband grow narcissi, iris, daylilies and chrysanthemums at "Sunrise Knoll" in Needham, Massachusetts. Mrs. Merry is president of the Bessie Buxton Branch of the American Begonia Society, treasurer of the Boston Gardeners' and Florists' Club, past president of the Needham and of the Newton Highlands garden clubs, and has just retired as vice-president, Region 4, of the American Hemerocallis Society. She and her husband lecture, and their lectures are accompanied by slides and films, for Mr. Merry is an expert in color photography.

OVER THE country hundreds of members of the American Hemerocallis Society are hybridizing their favorite flower in an effort to create newer and better varieties. From all of these hybridizers there are a select few who can be depended upon each year to introduce outstandingly fine varieties. Into the ranks of such prominent names as Kraus, Claar, Nesmith, Hall, Fay, Russell, Fass, and Stevens will move within a very few years the name of Stedman Buttrick of Concord, Massachusetts.

Mr. Buttrick's background well fits him for such a position. His estate, on which only Indians and Buttricks have lived, lies directly across the Concord River from the old North Bridge of Revolutionary fame. The original farm house has been replaced by a Georgian brick home and the farm, where all the food was once raised, has become a gentleman's estate.

Rolling lawns, shaded by fine old trees, are the setting for wide, long, perennial borders, enhanced by high evergreens; an interesting pattern garden with a decorative pool; and a fine swimming pool. Everywhere automatic sprinklers play to keep the lawns green. Beyond the swimming pool stretch still more wide borders, and the walk along the river is glamourized by more plantings. Rhododendrons, azaleas, laurel, and other shrubbery grow in profusion. An interesting rock garden with a waterfall and pool is planted with choice alpines, dwarf iris, and other suitable plant material.

From the daffodils of early spring to the chrysanthemums of late fall, there is a continual succession of bloom. In June the borders are beautiful with the rainbow colors of hundreds of varieties of tall bearded iris growing to perfection. Mr. Buttrick has long had an especial liking for iris and has some fine introductions to his credit. Huge clumps of peonies, many years old; delphiniums; hosts of the new lilies; phlox; *Hibiscus moscheutos*, and other perennials bloom in quick succession. These are all planted most effectively in respect to color, foliage, and manner of growth and the result is a graceful, most beautiful garden, always in meticulous order.

Mr. Buttrick has always had hemerocallis in his garden, and as the hybridizers began offering a wider choice of varieties, he began accumulating a fine collection. In comparison with the commercial growers who grow up to a thousand or more varieties, his collection is not large, but the two hundred twenty-five he does grow represent only the best. Plenty of space to grow and expand, fine soil, ample fertilizing, and sufficient water combine to produce the fine clumps of daylilies that predominate in the garden from mid-July to mid-August. Large clumps of that fine red, 'The Doctor' (Claar), 'Silent Night' (Kraus), 'Carved Ivory' (Nesmith), 'Her Majesty' (Nesmith), 'Jack Frost' (Lester), the choice 'Nashville' (Claar), the spidery 'Kindly Light' (Bechtold), the delicate 'Precious Treasure' (Nesmith) and 'Marie Wood' (Wood), the charming 'Fairy Wings' (Lester), the bold 'Orange Beauty' (Sass) — all of these tried and true varieties, to name just a few, appear throughout the borders.

Next year additional fine varieties from other hybridizers will bloom in his garden, including 'Bailey Walker' (Wood), 'Bobby Glasscock' (Greiner), 'Premier', 'Sweet Refrain', 'War Eagle' (Hall), 'Quincy' (Taylor), 'Burmese Ruby' (Smith), 'Diamond Dew' and Hollyberry Red' (Nesmith).

But the varieties that are gradually taking over are his own hybrids. He, too, saw the possibilities in this flower and began pollenizing, and in 1950 started keeping records and working in earnest in planning his crosses. With such a perfect background, both in plant material and landscaping, it is self-evident that his standards must be high. Even to be kept, a flower must be better, not just as good as, than any known variety. It must have good size, but not necessarily be mammoth; good substance to stand the hot sun of midsummer; must face front and be round in form, but not with segments as overlapping and recurved as amaryllis; must

A section of the pattern garden on the Stedman Buttrick estate, Concord, Mass.

have excellent branching and foliage; and, above all, be pleasing in color. If yellow, it must be as pale as possible; Mr. Buttrick hopes to achieve white, which may or may not be possible in a hemerocallis.

His first introduction was 'State Fair', a pure chrome-yellow, which is from a cross of 'Autumn Dawn' (Nesmith) X 'Kentucky Cardinal' (Nesmith) for the pod parent with 'Reliant' (Cook) for the pollen parent. It begins to bloom in mid-July, and the flowers remain open until late in the evening. The texture of the petals is like crepe and the color is very clear, even deep in the throat. This is not just another light yellow, but one which will draw attention wherever planted. The flower looks right at one. It is easily six inches across, the petals two inches or more wide, and sepals an inch wide.

Throughout the borders attention is drawn to an outstanding clump here and another one there, all with the notation Buttrick 54186 or Buttrick 54218A, or the like. From these years of crossing Mr. Buttrick now has seventy-five of his own cultivars planted in large clumps throughout the gardens and all of them are very worthwhile. He is extremely critical of his own hybrids and keeps only the very best.

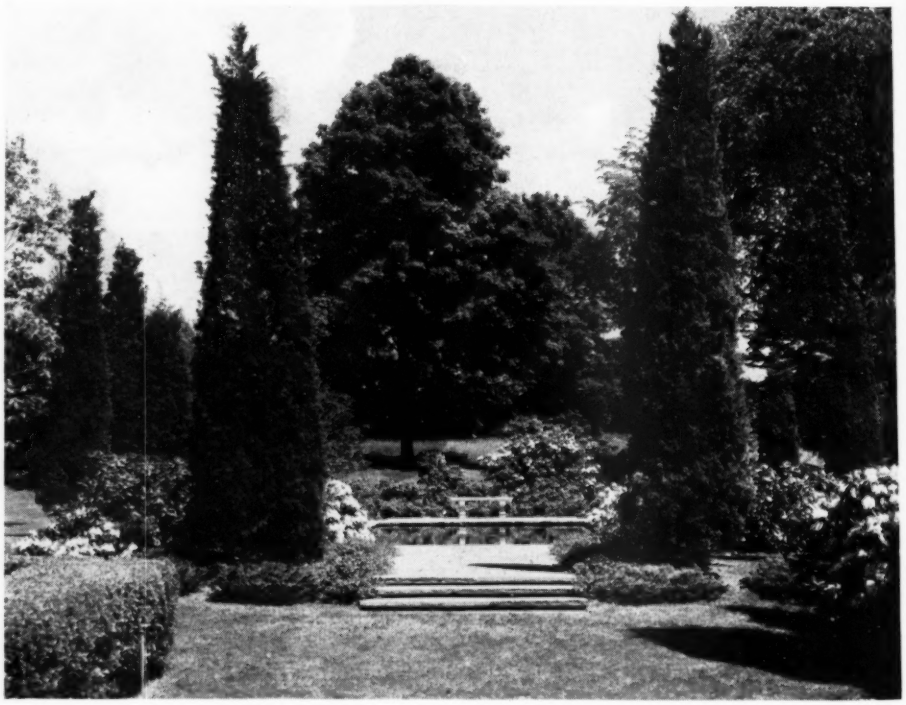
From these numbered seedlings, 54186 is a very fine crinkly orange with a slight halo. Although there are myriads of yellow and orange varieties, this one immediately appealed. 54218 is that subtle color called maize, also heavily crinkled, and with a slight halo — a variety to be desired.

Some flowers are triangular in shape and this is the characteristic of 5463, a very large flower of peach with a maroon halo and especially fine branching.

In his crossing, Mr. Buttrick has used 'High Noon' (Milliken), winner of the Stout medal for 1958, a beautiful orange-yellow with very wide petals of heavy texture that open flat and recurve. Since its first appearance, it has been a stand-out. These qualities are what Mr. Buttrick seeks. He has also used 'Cellini' (Wheeler), which has very broad overlapping segments of a delicate pale yellow and of extremely heavy quality. This variety remains open evenings, a characteristic that is most desirable in hemerocallis. The use of these varieties in his crosses, that is, using them with his previous seedlings, has resulted in these fine cultivars. For instance, his 54161 is an extremely heavy, light yellow with "terrific" (no other word describes it) branching. All fanciers will want this one.

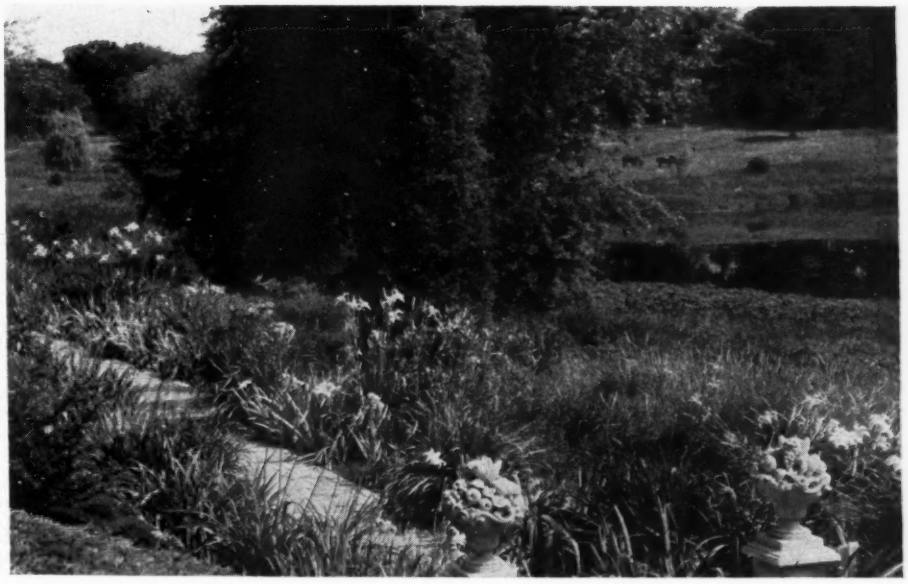
Other varieties used are the lovely 'Colonel Joe' (Lester), a very tall, large lemon-yellow, triangular in form, non-fading, and remaining open after dark, 'Soledad' (Kraus), a light buttercup-yellow of heavy substance with a broad and flat form, and strong, well-branched scapes and 'Nashville' (Claar).

When 'Nashville' was introduced in 1954, it was an immediate sensation. The base color is a subtle buff with a contrasting band of orange-red. The flowers are triangular in form and open quite flat, with the edges of the segments slightly crinkled and the petals pinched at the end; the texture is crepe-



Rhododendrons surround the swimming pool.

Daylilies grow along the Concord River.



like. This cultivar is still in great demand and still high in price. This description practically fits Buttrick 54186, with the notation that it is a better 'Nashville'. 54218A, a large light yellow with color extending into the heart of the flower, is most impressive. 1954 produced many fine seedlings and these are only a few, but these few were the most outstanding.

From 1952 came a charming buttercup-yellow (by number 5264C) whose smoothly finished segments were twisted at the ends. All of these seedlings were growing in established clumps so that their strong manner of growth and fine foliage were well displayed. They will all be a distinct addition to any collection, whether it is a fancier's collection or planted for pure garden value. And so through the borders his seedlings have been shown in the best possible manner and thoroughly tested before being named, registered, and introduced.

Beyond the formal gardens in a field near the river are the seedling beds where five thousand seedlings bloomed last year. Evaluation of these was very difficult, since there were so many good ones. From 'Precious Treasure' (Nesmith) and also from 'Afterglow' (Stout) were many in the delicate, almost ethereal, shell-pink tone, a color most difficult to describe, and many of these were much larger, with broader segments and better branching than the parents. Many of the seedlings are the result of line breeding, but Mr. Buttrick also introduces into his established strains desirable qualities from varieties of other hybridizers. His yellows are approaching white, and he already has had a lavender break. Next year from the seven hundred 1956 crosses there will be thousands more to bloom, which should be even better than the previous seedlings. It will be interesting to see how many of the five thousand have been kept.

In 1959 four of Mr. Buttrick's varieties, as yet unnamed, will be introduced by the Fairmount Gardens, of Lowell Massachusetts, so that other hemerocallis growers will be able to obtain these fine cultivars for their gardens. During the coming years his cultivars, selected with the utmost taste and discrimination from among his thousands of seedlings, will be something to anticipate and will place him in the front rank of hybridizers.

INSTANT BONSAI **(from page 85)**

This kind of adapting requires small-leaved subjects in order to keep plant and container in scale. There are many hardy varieties which will winter outdoors in the North, follow seasonal changes conventionally and simulate trees in a very few years. Patios and apartment gardens, which are so vacant and dismal in cold weather, need them, and picture windows should look upon them instead of into other picture windows. If they are tucked into soil or peat and mulched, they will need very little attention; and unless they are frozen fast, they can come into the house from time to time to meet guests. Sunk here and there in the garden, they add interest to areas which would otherwise be nude for months; or they can be bedded down in window boxes. Ampelopsis, so treated, will bloom and berry in two years from a cutting, and so will pyracantha; azalea, dogwood, holly, barberry, euonymous, and privet are content with this treatment, though not as quick to perform. There is a charming small flowering shrub whose juices, I have read, were used by the ancient Egyptians to dye their mummy-wrappings; it is indigofera, and will bloom in two years from seed. Such small trees as laburnum, koelreuteria, albizzia, and the hardy orange are easily raised from seed and grow and shape up rapidly. The willow family provides a number of suitable subjects, and they're no threat to the plumbing when they're in pots.

For anyone who lives in the tropics or who has one of those marvelous resorts, a greenhouse, at his disposal, there is a wealth of bonsai material. Many exotic trees grow rapidly, bloom young and remain small at maturity—such as poinciana, schinus, jacaranda, calliandra, bauhinia, myrtus, duranta and list, list, list. To get seed all one needs is a pal in Miami who is constitutionally able to reach up. There is a rare little cypress from Madagascar, called widdringtonia, which roots rapidly from cuttings and becomes a cone-bearing tree in remarkably short order. And a number of small shrubby numbers are more attractive presented as bonsai than as conventional pot-plants; four of my favorites are *Serissa foetida, Thunbergia erecta, Ceaonthus gloriosus* and *Malpighia coccigera*, the last two of which look like miniature hollies.

When you live with a bonsai over a period of years, its origin and history become of interest. Recently on television there was a "Bold Journey" movie of a Cincinnati zoo veterinarian, who took a herd of Nubian goats to Dr. Schweitzer in Africa. Cows the wonderful doctor couldn't have, for there was no forage for them, but milk was badly needed in his hospital; and the goats were to dine on the leaves of manioc. Aha! a friend has shown up on TV, for I have a bonsai of manioc, which is manihot, which is the source

of tapioca. Not long ago I read the delightful VOICE OF THE DESERT by Dr. Joseph Wood Krutch, in which he mentioned, apropos of I don't remember what, that *Acacia farnesiana* (alias popinac, opopanax, cassie, huisache and who knows what else) was named for a gentleman who was kin to the Borgias and the Medici and had introduced this little tree into the gardens of Italy. Bonsai can lead me down a road, and this was all I needed to envolve myself with history books and encyclopedias to figure which Farnese was related and how to Pope Alexander VI, or was it Lorenzo the Magnificent? From here I got into the related histories of Spain, Portugal, Holland and Belgium, for they got around, those old green-thumbers. HORTUS winds up on this acacia with: "Tex., Mex., Asia, Afr., Aust.; original nativity uncertain." So which Signor F, in which century from the twelfth to the sixteenth, and where did he find it? (My only bet is, it waren't Tex.) After all this I eyed my little seedlings of *Acacia farnesiana* with new fascination; here they were, ordinary "lil ole" bipinnate-leaved treelings in squatty pots in a twentieth century New Jersey glasshouse with all that history stacked up behind them. And, just to put an end to an ugly bit of gossip, let me quote Webster's BIOGRAPHICAL DICTIONARY, which states that Lucrezia Borgia has been "cleared by recent research of many accusations of crime and vice." Now isn't it wonderful what a bonsai can do?

And so, to purists and conformists who want their pot-trees centuries old, wired into arthritis and purchased for hundreds at that little shop near Gump's in San Francisco, I breathe a small and courteous pooh. I suggest that the best way to create an interesting and attractive specimen is to train the eye, or better yet let it train itself, to the look of the old, old ones of the East. Then when we see one we'll recognize it, whether it's on the "lone prayree" or at timberline, in a seed packet or on a window sill.

Like pizza, golf and Volkswagen, another good thing has come to us.

盆栽

GRAFTING OPPORTUNITIES *with* ORNAMENTAL TREES

By J. C. McDaniel

Continued from the March-April issue

Mr. McDaniel is Assistant Professor of Horticulture (Research) at the University of Illinois. He has included the persimmon and nut tree variety plantings at the University in propagation research on which he based his treatise, "Plastics and Fungicides Useful in Tree Budding" (Fruit Growing No. 13, University of Illinois). He has written for fruit, farm and garden publications and will have five nut tree articles in the 1959 edition of ENCYCLOPAEDIA BRITANNICA.

Mr. McDaniel's interest in tree varieties and their propagation began with his first apple tree grafting which he did while a seventh-grade student at Hartselle, Alabama.

Fraxinus, the ashes. *Fraxinus,* with about sixty-five widely distributed species in the northern hemisphere, includes handsome species, some with showy and fragrant flowers. Most of the American species are dioecious, and some grafted fruitless forms of the green ash are being offered as shade trees. This species also is used by some nurseries as a nurse stock in propagating own-rooted lilac bushes. Neither green nor white ash proved permanently compatible with American fringetree *(Chionanthus)* in 1956-57 tests at Urbana. Blue ash *(F. quadrangulata)* is probably the most interesting medium to large-sized tree among central Illinois native ashes. Although monoecious, it does not have heavy seed crops every year, and its seedlings do not seem to germinate as liberally as those of green or white ash. *F. ornus,* the flowering ash of Europe, is probably the hardiest of fragrant-flowered ash species.

Gleditsia, the honey-locusts. Several patented varieties of thornless male honey-locusts have become popular shade trees in recent years. An unpatented variety of good form and vigor is 'Beatrice,' named for its native town in Nebraska, and obtainable from Inter-State Nurseries, Hamburg, Iowa. Where heavy pods are wanted, the older 'Millwood' from North Carolina is probably the most productive thornless variety, though possibly too tender for the northernmost parts of Illinois.

Ilex, the hollies. Hollies may be grafted together, even evergreen scions on deciduous stocks, according to several reports. The popular American holly, *I. opaca,* so much valued (?) as a Christmas decoration that it was nearly exterminated in the most populated parts of its range, is now making a strong comeback in holly orchards and landscape plantings, with many hardy fruiting varieties having been commercially introduced in recent years, along with some hybrids between it and the far-southern *I. cassine.* 'Foster No. 2' is one of the hardiest of the hybrids. More hybrids, including some wide crosses, are being developed for introduction in the near future. With *I. cassine* as a bridge, some hybrids already in existence are said to combine genes from *I. opaca* and the traditional English holly, *I. aquifolium,* which has glossier leaves and larger berries. Already introduced at the Missouri Botanical Garden in St. Louis is a hardier Balkan strain of *I. aquifolium.* While no evergreen holly is native in this state, *I. decidua* is a spectacular berried species with a natural range up to Carbondale. Improved selections of it have been made in Alabama and Oklahoma, and in the latter state it is being used by some nurseries as a drought-resistant stock for *I. opaca.* Grafting can be used to insure fruitfulness on

lone trees of various species, all of which, as far as reported, are dioecious. Fruiting varieties of the Chinese *I. cornuta* (not quite hardy at Urbana) are parthenocarpic, and are the only hollies known to be fruitful without a pollinizer. However, the 'Monticello' clone of American holly (an old tree near Monticello, Illinois, said to have been moved from Pennsylvania) does

set fruit and mature seeds without any known source of outside pollen. Iron chelates help hollies in high-calcium soils; winter shade benefits evergreen ones.

Koelreuteria paniculata is the panicled goldenrain-tree of STANDARDIZED PLANT NAMES, and the "raintree" of the fictional Raintree County, Indiana, where the song has it blooming "early in the month of May." It comes nearer to the middle of June in actual New Harmony (site of the "Raintree Festival") and up to Springfield, Indianapolis, and Lake Erie. However, two trees on the Indiana University campus (near the "President's House") delay still longer and do not do their "raining" until late August and early September. Apparently fruitless, they represent a variety that ought to be multiplied by grafting, as very few hardy ornamental trees with showy flowers are in bloom that late. (The more finicky franklinia is one.) Rehder lists a similar species, *K. apiculata,* as equally hardy. In the same family *Sapindaceae* is *Sapindus drummondi,* western soapberry, which is rarely cultivated in Illinois.

Liriodendron, the tulip-tree. One of the handsomest shade trees for Illinois and the state tree of Indiana, Kentucky and Tennessee, *L. tulipifera* unfortunately tends eventually to grow overtoweringly large for a small lot. Now an Illinois member has a seedling that appears to be a true genetic dwarf, and it will be tried in grafting next spring. But even the common type is preferable to the similarly large-growing American sycamore. Tulip-tree clones include the narrow-growing pyramidal 'Pyramid' and the foliage variants 'Roundlobe,' 'Wholeleaf' and 'Yellow.'

Magnolia, the magnolias. This varied genus, north of the southernmost parts of Illinois, is most frequently represented in cultivation by the deciduous, early pink-flowered *M. soulangeana.* It can be used as a stock for several other Asiatic species and hybrids, some with darker red or purple flowers, others white-flowered and fragrant. One of the finest is a four-weeks-flowering, fragrant, white *M. kobus* var. *loebneri* (Blackburn) that is the rarest ornament in the "President's Garden" of the University of Illinois. It surpasses the 'Merrill' clone of this variety, judging from pictures of the latter, which show fewer petals. Among Illinois native deciduous magnolias, *M. acuminata* is a fine large shade tree, but has greenish, inconspicuous flowers. A hybrid form, originated by B. Y. Morrison at the U. S. National Arboretum, grows smaller and has deeper yellow flowers. Sweetbay magnolia *(M. virginiana)* is a fragrant, summer-flowering species, worth growing as a small tree nearly throughout Illinois. It can also be grafted with some soon-to-be-released evergreen hybrids (bred by Morrison) which are more like the southern *M. grandiflora* in habit, foliage and large fragrant white flowers. *M. grandiflora* itself is abundantly planted at Cairo and Metropolis; several trees have flowered as far north as Springfield and Urbana. This species is becoming popular at Indianapolis, preferably furnished with some winter shade. The evergreen hybrids should extend this southern style tree still farther north. *M. tripetala,* hardy to Cedar Rapids, is large-leaved.

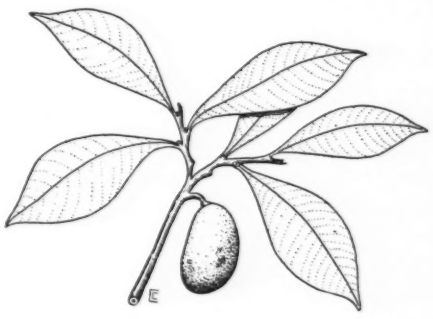
Quercus, the oaks. Pin oak, chestnut oak *(Q. prinus,* formerly *Q. montana)* and others have been experimentally grafted with various chestnut scions, and more or less permanent unions have resulted, though with generally less fruitfulness than where chestnuts are grafted on their own species. But oaks themselves have many beautiful or odd varieties which are best propagated by grafting on related oak stocks. Unusual leaf patterns, colors and textures, narrow or compact growth habit, and resistance to certain insects and fungi of some oak selections make them better than usual shade trees. Swamp white oak *(Q. bicolor),* for instance, looks better than bur oak in recent years around the University of Illinois campus area, because it is much less affected by the Kermes scale insects. Another fine specimen tree has been tentatively identified as the European hybrid 'Rosacea' (a cross of the Durmast and English oaks). Hybrid oaks in the Chicago area include the Bebb oak *(alba* X *macrocarpa)* and the Hills oak *(macrocarpa* X *muhlenbergi,)* the latter probably being the true parentage of the Deam oak near Bluffton, Indiana, judging from the way its seedlings tend to resemble bur oak. English oak has many varieties, and also has formed some hybrids with American species of the white oak group. All the preceding oaks should be graft-compatible on native white, bur or chinkapin oak stocks. Overcup oak, native to flooding areas, and chestnut oak from sandy uplands are two other adaptable species not commonly cultivated.

Pin oak, shingle oak and red oaks should take grafts of their own hybrids and those from other species belonging to the black oak subgenus. Little cultivated in Illinois is the narrow-leaved willow oak *(Q. phellos),* though it appears hardy to Springfield and Urbana. One of its hybrids is hardy to Chicago. *Quercus acutissima,* sawtooth oak, from Asia, is one of the handsomest and fastest growing.

Tilia americana. The American linden, or basswood, is graftable with varieties of its own species, as well as others from America and abroad.

Sorbus. Of the many species that make small to medium trees, *S. aria, S. torminalis* and *S. latifolia* are among those that appear to have better southward adaptation than *S. aucuparia,* the mountain-ash most frequently sold by

(Continued on page 105)



JACQUES LEGENDRE- and Gulf Stream Nursery

By **Dorothy Ebel Hansell**

THE RETURN TRIP from the American Horticultural Congress in Williamsburg last October afforded the opportunity I had long been waiting, to visit Gulf Stream Nursery and to "talk shop" with Jacques Legendre and Robert H. Talley, Jr.

Reasonably early on Sunday morning, October 26, my husband, daughter Mary-Elisabeth, and I drove some miles along the southern end of the Del-Mar-Va Peninsula to Wachapreague. Signs proclaimed it to be "the oldest fishing resort in the State of Virginia." A wrong turn brought us to the harbor, beautiful in the morning light, where fishing boats were anchored and fishermen were gathered comparing notes on the morning's catch. Said one of the old natives in the group, "Reckon I'd be happy to tell you-all strangers how you can find Gulf Stream. You can't miss it once you take the right road, for it has rows and rows of plants inside a high hedging."

Accepting his directions, we soon found our way to "the rows and rows of plants inside a high hedging." In the center of a broad stretch of level land stood a square farm house; to the left propagating frames, lath houses, and service buildings. The whole place was bathed in Sunday peace. Not a human being was visible.

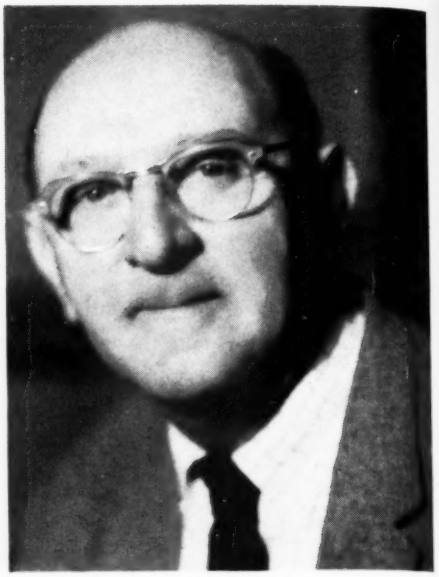
We parked the car and walked quietly along the driveway until we came to an opening in a brick wall, entry to a beautiful walled-in garden, about one hundred and twenty feet wide and running five hundred feet from the house to the water's edge. Against the brick walls pyracanthas, laden with their brilliant fruit, were espaliered and sasanqua camellias were bearing their exquisite blooms. Clusters of rich orange-red berries were hanging on *Idesia polycarpa*; this was our first sight of the fruit on this tree. Harold Epstein, President of the American Rock Garden Society, gave us a young tree, but it lived through only three winters in our New Jersey garden. The cold winds were evidently too much for it. (Later Mr. Legendre questioned the hardiness of *Idesia polycarpa* so far north.)

The borders in front of the pyracanthas, camellias, and azaleas were filled with perennials. Some were still in flower; others, of course, had lost their prime. The rose beds, in which new cultivars are tested, were still in bloom. At the far end of the garden, a bed with soil smoothly tamped had just been planted with tulips and "will be carpeted with forget-me-nots to catch the blue of the water," as Mr. Talley informed us a little later. What a heavenly picture to gaze upon from the garden room of their home.

Still no stirring of life, so we wandered through another opening in the brick wall to the nursery field. Mary-Elisabeth detected a car partially concealed by shrubs, her father the faint sound of voices — and almost immediately Mr. Legendre and Mr. Talley walked into view. They had been on an inspection of some of their plants. Seedling dogwoods, boxwood from cuttings, sasanqua and japonica camellias, azaleas—everything by the thousands. We were impressed by the row upon row of sturdy stock plants of althaea 'Blue Bird,' their five and a half inch flowers forming seed and being carefully watched; the seed would be collected at exactly the right time.

Mr. Legendre had searched many years for a really fine large-flowered single blue althaea. He came across this one in a nursery in France and took steps to introduce it to American gardens. This means that he brought back plants, tested them, and then raised more and more plants to build up a sufficient supply.

Mr. Legendre has long been interested in single althaeas and recalled the good white one, growing in the U.S. Botanic Garden in 1908, which Henry A. Dreer, Inc., of Philadelphia, introduced in 1912 under the name of 'William R. Smith.' Mr. Smith was then the superintendent of the U. S. Botanic Garden. Mr. Legendre also mentioned 'Woodridge,' a fine single red originated by Notcutt Nurseries in England, and 'Hamabo,' a lovely striped pink with red center, introduced some time back. He remarked that 'Blue Bird' brings an entrancing shade of blue, like that of a summer sky, to this group of noteworthy garden shrubs.



Jacques Legendre

I noticed a compact-growing hybrid musk rose with a spread of three feet or so, deep green foliage and nice clusters of cherry-red flowers at the ends of arching branches. It was rose 'Robin Hood.' Mr. Legendre had become disturbed by the way unsuspecting home owners were buying *Rosa multiflora* as a hedge or boundary rose. *R. multiflora* serves its purpose in keeping marauders from extensive acreage, but it is certainly not a rose for the small property. "Somewhere in England there must be a hedge rose that will fill the bill," reasoned Mr. Legendre. "One that is compact in growth, attractive in flower, thorny enough to ward off intruders, but better suited to suburban American gardens than *R. multiflora*."

He spoke to George Jackman of Woking, England, on one of his trips to that country, and Mr. Jackman showed him the hybrid musk rose, 'Robin Hood,' originated in England in 1927 by Pemberton. Plants were received at Gulf Stream Nursery and after being tested and propagated, 'Robin Hood' was offered in spring 1958 to American gardens through leading catalogue houses in this country.

Forsythias 'Beatrix Farrand' and 'Lynwood Gold' are two other Legendre introductions. The former was orig-

inated at the Arnold Arboretum—the initial propagating stock came from Dr. Ralph Sax. This is a hardy forsythia, enduring severe winters; and according to Dr. Donald Wyman, Horticulturist at the Arboretum, it has bloomed at snow line. 'Lynwood Gold' was developed from cuttings obtained on a trip to Ireland. A nurseryman who had sold a specimen of *Forsythia suspensa* to the owner of "Lynwood," an estate in Ireland, received a telephone call for him to come to look at the shrub as several of its branches were quite unlike the rest. He took cuttings, propagated them, Mr. Legendre noticed the young plants in the nursery—and that's the beginning of 'Lynwood Gold,' an excellent cultivar.

My husband's eye was caught by the clear yellow flowers on hypericum 'Hidcote.' Mr. Legendre told us that it had been found growing on the famous Hidcote estate in England, now run by the National Trust. He had noticed the young stock plants in the nursery of T. Hilling & Co., Ltd., at Woking. Impressed by its compact habit and the clear yellow color of its fragrant, cup-shaped flowers, he decided to test hypericum 'Hidcote' at Gulf Stream Nursery and, if it proved worthy, to propagate it for American gardens.

A "find" which Mr. Legendre tested, propagated, and then licensed its introduction to American gardens, is tamarix 'Pink Cascade.' He found this shrub, which carries panicles of flesh-pink flowers from July to September, one day when walking through the Jackman Nursery in Woking, England.

Campsis (Bingonia) radicans 'Yellow Trumpet' is still another Gulf Stream Nursery introduction. This is a fine yellow form of the native trumpet-creeper which Mr. Legendre noticed in the Woodberry Forest, Virginia, garden of the late Mrs. Violet Walker.

Mr. Talley drove us in the station wagon to the far end of the nursery so that Mr. Legendre could show us the viburnums. One remarkably fine specimen was bearing a heavy crop of glistening red berries along its branches. Mr. Legendre and Mr. Talley were eagerly waiting the arrival of Dr. Francis de Vos from the National Arboretum, Washington, D.C., and Dr. Donald R. Egolf from Cornell University, Ithaca, New York, to examine, identify, and express their opinion on its merits. (At a meeting with Mr. Legendre in New York City in January 1959, I learned that Dr. de Vos took cuttings of this viburnum and others for propagating and testing at the National Arboretum, and that cuttings will be given similar treatment at Gulf Stream Nursery.)

Wisteria blooms luxuriantly on the arbor above a walk in the beautiful walled-in garden at Gulf Stream Nursery.

Perhaps I should explain here that Gulf Stream Nursery grows plants on a wholesale basis only; its introductions are released through retail nurseries and usually, for the first time, through Wayside Gardens, Mentor, Ohio. J. J. Grullemans of Wayside Gardens and Mr. Legendre are friends of long standing.

Introducing good plants to American gardens is no new thing to Jacques Legendre. He has been doing it for over thirty years. The first plant he brought back from Europe was *Berberis thunbergii atropurpurea* which he had seen in a nursery in Orleans, France. He arranged for its introduction by Henry A. Dreer, Inc., of Philadelphia in 1926. Mr. Legendre was not aware at the time of the restriction on barberry because of a rust disease, and before government inspectors gave the "go ahead," there were one hundred thousand plants in Dreer's nursery waiting to be sold.

He also arranged for Henry A. Dreer, Inc., to handle roses from Pernet Ducher and can feel justifiable pride in the fact that he is responsible for negotiating the first contract to pay royalty for a three-year period to a foreign hybridizer. In those days there were no plant patents. A hybridizer worked diligently to create a new plant, sold it—and that was that. No further income accrued to him, no matter how many plants of his origination might be sold. 'Souvenir de Georges Pernet' and 'Souvenir de Claudius Pernet' were the first roses covered under a royalty contract and provided old Mr. Pernet with money to live on for the rest of his life. Subsequently Henry A. Dreer, Inc., entered into royalty contracts with Dickson of England and McGredy and Sons of Ireland.

Jacques Legendre is considered to be the best informed nurseryman in this country and commands the respect of every one who knows him — in this country and abroad. He selects and tests plants carefully, then propagates sufficient stock before disseminating them. "No sense in getting people excited about a plant, if you're not prepared to supply them," is Mr. Legendre's philosophy.

Mr. Legendre, who was trained in horticulture in Germany and England,

as well as in France, his native land, came to this country in 1912 and went to work for Henry A. Dreer, Inc. Immediately war was declared, he sailed for France. World War I over, he returned to Dreer's and remained with that reputable horticultural concern until 1926, when he left to establish Le Mac Nursery at Hampton, Virginia. In December of that year, the Massachusetts Horticultural Society awarded him the Thomas H. Roland Gold Medal for skill in horticulture.

At the death of Dreer's president, J. D. Eisele, in 1934, Mr. Legendre was recalled to help run the business. He became vice-president and sales manager and remained until 1940.

About that time, during a visit to his friend, the late Lambertus C. Bobbink, Mr. Legendre became acquainted with Mr. Talley, who had been with Bobbink and Atkins, in Rutherford, New Jersey, for only a year, just since his graduation from Virginia Polytechnic Institute. When Mr. Legendre proposed that Mr. Talley join him in a nursery venture in Virginia, the idea was irresistible. To Mr. Talley there is no state in the United States as wonderful as his native Virginia.

The acreage selected in Wachapreague was undeveloped rural property — they literally built their nursery "from scratch," tilling more land each year until Gulf Stream Nursery now occupies sixty flourishing acres.

The Legendre-Talley relationship is unique. It is seldom one finds a partnership in which both men complement each other, sharing the same interests. Both are enthusiastic, intelligent plantsmen—plants are not only their business but their hobby. Mr. Talley is content to remain in Virginia and look after the thriving nursery. Mr. Legendre likes to travel. He has made many trips abroad, seventeen while with Henry A. Dreer, Inc., and six since World War II, always on the alert for new plant material.

On his trip to Europe in 1947, he was accompanied by Miss Helen Totty, daughter of the late Charles H. Totty, of Madison, New Jersey, with whom he had enjoyed close friendship. They — Mr. Legendre and Miss Totty — judged the roses at Bagatelle, previewed the first Chelsea Show after the war, then visited rose establishments, nurseries and gardens on the continent and in England. In telling me about this trip, Helen said, "It was a tremendous experience, Dorothy, with Jac's wide acquaintance on the continent and mine in England through Daddy. Everywhere we traveled we were warmly received. It was Jac's first visit after World War II and when we reached Wisley, he dashed ahead eagerly to see certain loved trees and shrubs. He knew exactly where to look for them and greeted them like old friends."

Mr. Legendre and Mr. Talley have another similar interest — they collect antiques, Mr. Legendre French, Mr. Talley American, and these are discriminately, harmoniously blended as the furnishings of their home. Beautiful old furniture, silver, china and other appointments — many of them from their respective families — are lived with, used, and fully appreciated. Their lovely home has been open to the public to raise money for the local hospital, to a special pilgrimage of the Horticultural Society of New York, and during Garden Week in Virginia. In appreciation of their generosity in opening their home for the benefit of the hospital, local garden club members made the exquisite petit pointe seat coverings for the chairs in the dining room. What greater tribute could be paid to these two fine horticulturists than this "labor of love?"

LOST WORLDS (from page 84)

sandstone', leaving the spectacular plateau-mountains of the "Lost Worlds."

The point to all of this is that the remnant vegetation, probably extending in unbroken continuity from the beginnings of flowering plants to the present time, provides a situation not obtained in the valleys of the Amazon and the Orinoco, where the land has several times been inundated and the plant life successively destroyed and successively renewed. These great mountains may well have stood as plant refugia in times of inundation, and sources of revegetation of great areas of South America during periods of relative elevation.

For these reasons, the floras of Guayana are vastly interesting to the student of plant taxonomy, plant geography and of evolution.

Not only is the area of compelling interest because of its history, but also because the great diversity of its physical and climatic character that has led to the evolution of an extraordinarily rich, diversified, and beautiful vegetation. Comparison with a region well known to all of us might help convey a suggestion of this extraordinary diversity.

The flora of the northeastern United States and adjacent Canada, a region of some eight hundred thousand square miles, has some forty-six hundred species of flowering plants and ferns. The sandstone region of Guayana occupies certainly less than two hundred thousand square miles, yet it has developed a flora most probably of not less than fifteen thousand species! This suggests a flora twelve times as rich and diversified as ours.

And, may I make an observation about our exploration. Successful exploration is a business. We have achieved a reasonable, modest result from ours. At no time have our lives been in jeopardy. We have lost no men. We have had no grievous accidents. I'm afraid that we look upon those who do relate such tales as having conducted rather misadventure, not adventure. To be sure, there are times of difficulty and exasperation. Heat and cold are excessive. So is rain. Insects are of great annoyance. Sometimes one is taxed to the limit of physical endurance. But, all of these are part of the job. And, there are vast compensations and satisfactions.

I have been the photographer on these expeditions. If there have been times of pressure or excitement, I have had to be doing other things—not taking pictures! Therefore, coverage and quality are not perfect.

FLOWERS OF THE MIDNIGHT SUN

in the Canadian Arctic

By Mildred U. and Raymond D. Wood

Continued from the March-April issue

Mr. and Mrs. Wood specialize in the photography of plants. Previously they covered the eastern seaboard to the Rocky Mountains; now they are engaged in photographic studies of the flora of the North American Arctic.

IT MIGHT BE OF INTEREST to point out some of the locations in the Canadian Arctic where we have worked. We have visited Churchill, Manitoba, in two different seasons; Churchill is just at treeline and so, botanically, is at the extreme southern edge of the Arctic. We have worked on Southampton Island in northern Hudson Bay, at Baker Lake in central Keewatin — the so-called barren lands—, the north coast of the continent in the Coppermine area, and Victoria Island in the Archipelago. We have visited also the areas of Great Slave and Great Bear Lakes, which for our purposes may more properly be designated as subarctic.

It is only north of the Arctic Circle that one enters the land of the midnight sun, where grow all of the plants we shall describe. To the astronomer this is the Arctic, where at least one day during the summer the sun never sets, and at least one day during the winter it never rises. The meteorologist might well say that the area north of the 50° isotherm for July, the warmest month, is the Arctic. For the botanist, however, the northern limit of tree growth marks the beginning of the Arctic. Around the world this line varies for numerous and obvious reasons. In North American it enters northwestern Alaska, following the Brooks Range east to the valley of the Mackenzie River, under the moderating influence of which it juts north to within a few miles of the Arctic Ocean. Continuing east it passes just north of Great Bear Lake, and then drops rather sharply southeast across the barren lands to Churchill on Hudson Bay, and on down to James Bay. North again along the east coast of Hudson Bay, it crosses central Ungava in Quebec Province to the coast of Labrador, whence it drops south leaving only a coastal strip of Labrador within the botanical Arctic.

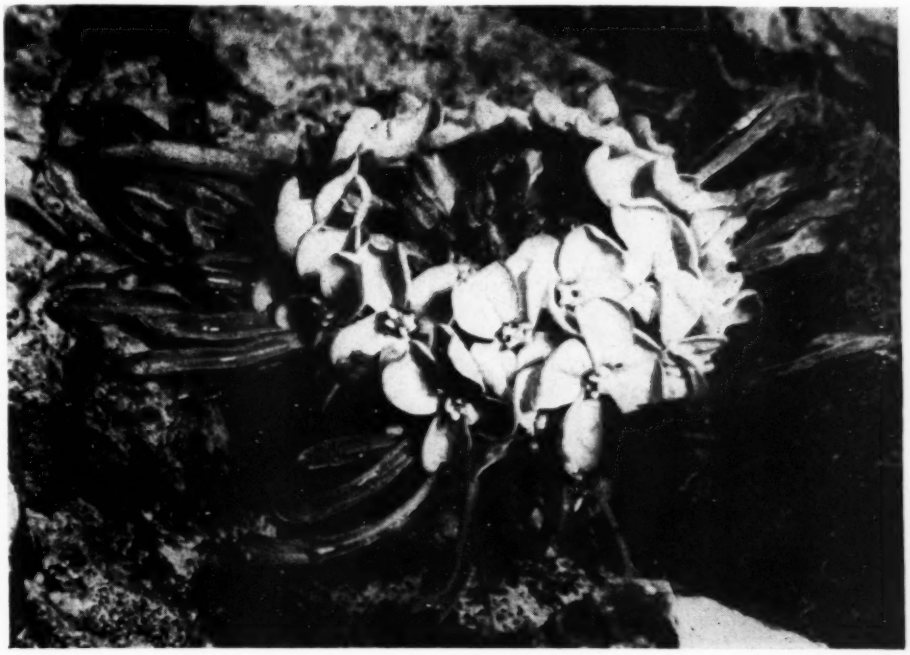
What is the Arctic? First and always, it is an area of eternal ice, where frozen waters are the rule and not the exception. Whether it be the fractured, though consolidated pack of northern Hudson Bay, or the more regular pattern of the Arctic Ocean, the ice is always present or near. Not only on the seas and lakes, but also on the rivers, ice is present for all but a few weeks of the year. Even then, on the banks of the larger rivers, following spring breakup in June, large masses of ice are cast on the shores, there to assume grotesque forms, and to melt slowly and perhaps incompletely before the ensuing freeze-up.

The Arctic is a land of lakes, lakes beyond number, which may vary in size from mere ponds to inland seas such as Great Slave and Great Bear Lakes.

The Arctic is a land of rivers, which may spread placidly to majestic proportions to emphasize vastness without limit, and utter stillness; or, alternately, may be compressed narrowly into chasms and gorges cut in solid bedrock, where the incessant roar of falls and turbulent rapids reminds one that the Arctic is dynamic.

At the river's edge begins the tundra, stretching in undulating planes to the distant horizon. Viewed from the air the tundra appears in character as a land of monotonous desolation, but that is because one is unable to perceive its intimate beauty. On the ground an interested observer sees neither monotony nor desolation. Perhaps we see an area of so-called lichen tundra, the ground almost completely covered with fruticose lichens. On the ridges there are ice-shattered, lichen-covered rocks. Here, in this vast treeless region grow the flowers of the midnight sun.

The tundra has been called "a rolling world of faded brown." It is true that brown usually predominates, because for every green thing there are many brown things, remnants of the vegetation of past years. The coasts are frequently rocky, and in such cases the nitrogen-loving orange lichen, *Caloplaca elegans*, adds to the natural beauty of the rocks as viewed against the background of the sea. As the shoreline is reached, however, the rocks, ice-scoured almost throughout the year, can no



Erysimum pallasi, Arctic wallflower.

longer furnish support even for the humble lichen.

I have mentioned previously the churning effect of alternate freezing and thawing on the water-saturated soil above the permafrost level, resulting in the formation of various structures such as stone stripes, tussocks and soil polygons. These polygons may be a few inches or several hundred feet in diameter. One of the earliest stabilizing influences in such areas is the growth of the purple saxifrage. By way of contrast the tussock formation is well covered with vegetation, although the species growing on the tops and sides of the tussocks will be different from those growing in the bottom between them.

Finally, the Arctic is a land of widely-spaced and remote settlements, where man clings precariously to the shores of an inland lake in the Barren Grounds, or to those of the Arctic Ocean farther north. In either case the next settlement may be hundreds of miles distant. But these settlements, small though they be, are as populous centers when compared to individual Eskimo encampments isolated on a low spit of land in the arctic seas.

Where do plants grow in the Arctic? They grow in and near snow*patches*, where the snow affords winter protection but melts early. Woody plants must have a winter snow cover in order to survive. A snow*bed*, perhaps still of considerable proportions in mid-July, would permit the growth of woody plants only along its outer edges, for the snow in the center would melt too late. The center could support only such rapidly-cycling plants as purple saxifrage, arctic poppy, and alpine whitlow-grass.

Flowers grow on otherwise barren gravelly ridges raised but slightly above the level of the sea, as on Victoria Island in the high Arctic, with an isolated Hudson's Bay Company post in the background. Flowers grow on cliffs overlooking the arctic seas, even where only a spoonful of soil has been accumulated in a crevice. Flowers grow on the banks of rivers and their profusion and gaiety do much to relieve the brooding silence of limitless space. Flowers grow in low, wet tundra along the margins of seas, lakes and rivers. And, of course, they grow on the open tundra, whether in the Barren Lands of the interior, on the shores of the arctic seas, or on those of Hudson Bay.

I have mentioned that arctic soils are sadly deficient in nitrogen, and the effects of local enrichment around bird cliffs, owl perches, animal burrows and human habitations. On a low ridge in the tundra the presence of a den of sik-sik's, or Parry's ground-squirrels, results in relatively lush vegetation. The most remarkable results of added nitrogen are seen in the neighborhood of old Eskimo encampments, where both the human element and many generations of sled dogs have contributed to the enrichment of the soil. And now for the flowers of the midnight sun:

Dryas integrifolia, the arctic dryas, merits first consideration in our parade of arctic flowers. It is the appropriately designated official flower of the Northwest Territories, which includes almost all of the vast Canadian Arctic. It is a ubiquitous pioneer species, ecologically one of the more important and, perhaps, the most common of all.

The arctic lupine, *Lupinus arcticus*, is an arctic-alpine endemic of northwestern North America, with only one known station in the eastern Arctic. It is one of the Arctic's most showy flowers, and its gregarious manner of growth permits it to display truly beautiful mass effects. The leaves are water-repellent, so that after a shower the water forms a multi-faceted jewel in the center of each whorl. We call them Coppermine diamonds, because it was in that area that we first met the arctic lupine.

Cassiope tetragona, the arctic white-heather, has been called the "sentinel of the Arctic proper" and appropriately so, because it is not found until one is well north into the Arctic. Of all heaths it is the only species to be found within four hundred miles of the North Pole, as far north as there exists land on which to grow. It is ubiquitous and

Pyrola grandiflora.

Arnica louiseana ssp. *frigida.*

locally abundant or even dominant. It is important as a source of fuel, being so rich in resin that it will burn even when moderately wet and when dry burns with a hot flame.

Cassiope hypnoides, the moss-heather, is confined in North America to the eastern Arctic and is chiefly a low-arctic and alpine species. However, it occurs on Baffin Island north of the Arctic Circle and is widely distributed in Greenland. It is said that this species is probably the world's smallest heath. When not in flower it is casually indistinguishable from moss, thus justifying the specific name *hypnoides*—moss-like.

The mountain heath, *Phyllodoce caerulea,* has circumpolar distribution, but in North America is encountered much more frequently in the East. Except that it has a few stations in Alaska, its distribution in the western hemisphere closely parallels that of the preceding subject, the moss-heather. It might be noted that as applied to the North American plant, the specific name *caerulea* is a misnomer, for the purplish red corolla tends to turn blue only on aging.

The alpine azalea, *Loiseleuria procumbens*, is one of the real gems of the heath family's arctic representatives. Characteristically growing in association with the snow lichen, *Cetraria nivalis,* it reaches about the same height, and the two of them frequently form most attractive beds. While of circumpolar distribution, it is what botanists call a taxonomic relic, that is, it is the sole surviving species of what was formerly a much larger group.

Ledum decumbens, the narrow-leaved Labrador tea, is the arctic counterpart of our more commonly known *L. groenlandicum*. Its distribution is confined to eastern Asia and North America. In not too wet tundra it is sometimes dominant over considerable areas.

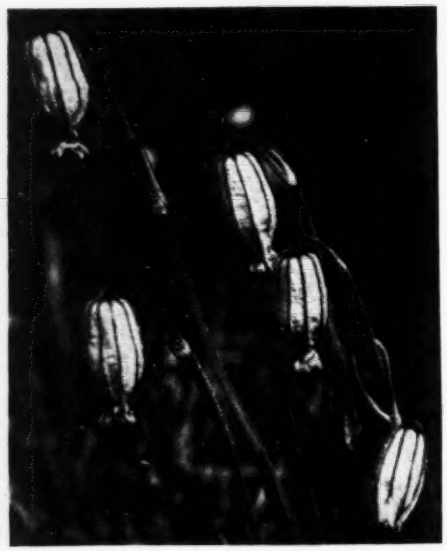
The mountain cranberry, *Vaccinium vitis-idaea,* is of circumpolar distribution, and the American representative is the variety *minus*. It occurs always in acid areas, chiefly in dry tundra among other dwarf shrubs. The fruit remains on the plant throughout the winter and is at its best in the spring. In the Scandinavian countries the fruit of the typical plant is widely harvested, both for home consumption and for export. It may be purchased in the United States as a rather expensive delicacy, under the name lingonberry.

In the Arctic the alpine bilberry, *Vaccinium uliginosum* var. *alpinum*, is usually called the blueberry. There are no true blueberries in the Arctic. The species as a whole is circumpolar in distribution. The fruit, ripening in August, is sweet and delicious and, in our opinion, fully the equal of any wild blueberry.

Rhododendron lapponicum, the Lapland rosebay, is a dwarf shrub bearing showy flowers, which at best may lend their color to an entire landscape. This species also points up excellently the very slow growth of woody plants in the Arctic. In its trailing stems, no thicker than a man's thumb, no less than four hundred annual rings have been counted.

Andromeda polifolia, bog rosemary, is a low-arctic species of the continental mainland, not known in the Archipelago. It is closely related to the more southerly *A. glaucophylla.*

Arctostaphylos alpina, the alpine bearberry, is known in the Arctic as the ptarmigan-berry, because its fruit is an important source of food for birds. The fruit is black and shiny when ripe and, while edible, is rather insipid. Like so many of the heaths, the leaves turn a beautiful wine-red in the autumn and, fading to brown, remain on the plant throughout the following year. If we have seemed to emphasize the Heath family, then it should be pointed out



Melandrium apetalum ssp. *arcticum.*

that the *Ericaceae* is of great importance in the Arctic, more so for the great number of individuals than for the number of species.

The Arctic is fortunate in having many species of buttercups. The bird-foot buttercup, *Ranunculus pedatifidus* var. *leiocarpus,* is one of the larger, and in flower texture and general appearance resembles more closely than do the others the buttercups of temperate lands. *R. pygmaeus,* the dwarf buttercup, deserves its name. The flowers are about three-eights of an inch in diameter. It is a snow*patch* plant, meaning that it must have winter snow cover which must melt early in the summer. The white water-buttercup. *R. subrigidus,* is one of the very few species of obligate fresh-water plants in the Arctic. All such plants are rare there, restricted, as they are, to small, shallow ponds that become free of ice early owing to a favorable exposure. *R. lapponicus,* the Lapland buttercup, grows in damp moss or in sphagnum bogs. Although only two inches in height, it towers over its neighbor, the net-veined willow, *Salix reticulata.*

The northern anemone is one of only two species which occur in the Arctic. *Anemone parviflora,* in the Far North, is generally restricted to southern and favorable exposures. The sepals, while pure white above, are silky and delicately tinged with blue beneath. *A. richardsoni,* Richardson's anemone, is a species usually and almost exclusively found in willow thickets, where it has a sufficient but nevertheless early-melting snow cover. Among willows in a shallow depression, its requirements are met and it is at its best.

Neither of the tofieldias are very photogenic, but they are of interest because they are the only arctic representatives of the huge Lily family. *Tofieldia pusilla,* dwarf false asphodel, is quite common and is circumpolar. *T. coccinea* is a much rarer, lime-loving plant with a peculiar and spotty distribution in North America and eastern Asia.

Oxyria digyna, mountain sorrel, is frequently referred to as the rhubarb of the Arctic. It does indeed resemble rhubarb in taste and is one of the most important food plants of the area. An admirable scurvy-preventive, it has saved many lives. *O. digyna* has a high vitamin content; the leaves and young stems may be eaten raw as a salad, cooked as a vegetable, or stewed as rhubarb. It is gathered by the Eskimos who eat the leaves fresh or preserve them in seal oil. Fresh leaves and stems are eaten by caribou, muskoxen, and geese, while lemmings and arctic hares prefer the fleshy rhizomes.

Polygonum viviparum, alpine bistort, is another important food source. The root-stock may be eaten raw but is better when cooked; it is a choice delicacy of some Eskimo groups who preserve it by freezing or in seal oil. The bulbils are eaten by ptarmigan and lemmings. The lower flowers on the spike are replaced by these bulbils for vegetative reproduction. A great many arctic plants must of necessity have adapted themselves to various means of vegetative reproduction, as otherwise they would be unable to survive in unfavorable years.

Pinguicula vulgaris.

Caltha palustria var. *arctica,* the arctic marsh-marigold, is a western arctic relative of the familiar plant of our temperate zone. Its manner of growth is similar to that of our own plant, in shallow water or wet marshy places.

To be Continued

BEGONIAS (from page 86)

talked about species belonging to this group. Most exasperating is *B. kenworthyi,* introduced in 1948 by MacDougall from Mexico and named for the late Eva Kenworthy Gray, beloved begonia hybridizer. It has a real star-shape with five points and the rubbery-like leaves are slate-grey in color, with an unusual grey-purple bloom, depressed light veins and red underneath. The one plant I had for five years I was unable to propagate and, alas, it is now dead. A hybrid of *B. kenworthyi* produced in 1953 by Don Horton, which he named 'Kumwha,' sounds interesting to me; perhaps some day I shall acquire that and have better success in growing it. Don describes 'Kumwha' as having gray blue-green leaves with lighter veins and red underneath. He produced it by crossing *B. kenworthyi* with 'Reichenheimi.'

Most sensational of obscure origin is 'Iron Cross' which was introduced to England from Malayria by Maurice Mason. 'Iron Cross' has large rough red hairy leaves, which are puckered and pimpled and apple-green in color. The dark chocolate - brown pattern, which surrounds the four main veins, is in the form of a German Iron Cross. 'Iron Cross' is not difficult to grow; and although it has become available to the trade only in the past year, it is bound to be more plentiful as it can be produced from seed. Seedlings may not come one hundred percent true. However, seeds my husband planted about a year ago produced fifteen plants of which only one is not true to type.

Each year when it comes time for repotting the rhizomatous begonias, which is usually done in August, I try in vain to cut down on the number, but each one has its charms. With the many new hybrids being developed each year, it is a challenge I cannot resist, and so the number increases, crowding out those already in the collection.

TIME TO FERTILIZE

By Freeman A. Weiss

Dr. Weiss prepared this material especially for rose growers—it was published originally in the April 1958 BULLETIN of the Potomac Rose Society, but his remarks on fertilizing practices apply as well to all plant growers. Dr. Weiss was a plant pathologist with the U.S.D.A. for thirty years, is now Curator of American Type Culture Collection, Washington, D. C.

To the nature gardener the proper nutrition of plants is a simple and sure process. Essentially it consists of providing a liberal supply of organic matter, which acting upon the basic minerals assumed to be present in all soils, whatever their origin, releases just the right amount of each essential nutrient for plant growth. Sometimes a bit of extra phosphorous is conceded to be needed, provided it is obtained from bonemeal or phosphate rock, uncontaminated by artificial chemical treatment. A supplement of nitrogen may be tolerated too, but only if it comes from a safe organic source, such as animal by-products. One should never be concerned about a particular ratio of the major plant nutrients—nitrogen, phosphorous, and potassium—because the plant itself will absorb them selectively as and when it needs them at any growth stage. It is only a sheer waste to add these elements in commercial fertilizers, and much worse—ruinous, in fact, to the soil—if any chemical materials such as nitrate of soda, sulfate of ammonia, muriate of potash, etc. are used. True, these names do sound a bit grim, but the materials themselves are common ingredients of most commercial fertilizers and as such have been in use for a long time, in the course of which some record-breaking crop yields have been produced by them. In fact, some fine roses have been produced from materials such as these, without benefit of any animal product at all.

This leads to the other side of the fertilizer story, which in its extreme form involves one in all kinds of complicated chemical formulas, with special ratios of the major elements for different kinds of plants, and containing numerous accessory or trace elements that have been found essential for plant growth, though only in extremely small amounts. Working out a nutritional program for a plant becomes a complex chemico-mathematical exercise. Such diversions are doubtless entertaining, and perhaps keep one from falling into more objectionable habits, but it has not been convincingly shown that they really result in better roses.

It should be kept in mind that the absorbing organs of plants—the roots—are not mere inert sieves that let anything through that may be dissolved in the soil water. They are selective to a marked degree, taking up materials (always in solution) that the plant needs at a particular stage of growth and excluding others not needed at that time; also changing the pattern of selection as the plant progresses from seedling to maturity. The roots are not perfectly selective in relation to the plant's needs, however; if you expose a plant to an excess of one element, that element is likely to be taken up out of proportion to others, and unbalanced nutrition results. For instance, an excess of nitrogen usually results in a soft, succulent growth of tissue, lacking strength and rigidity and low in cold resistance; furthermore, the plant develops vegetatively at the expense of bloom and fruit. Excessive uptake of certain elements beyond the need for normal growth may lead to toxic effects, just as the lack of an essential element may produce a deficiency disease.

Most gardeners — and for present purposes we mean rose gardeners — choose a middle course in their fertilizer practice. They avidly acquire and use all the organic matter they can get —manure, compost, and purchased materials such as peat — and they supplement it with chemical sources of the major and minor plant nutrients. No one has been able to show that plants distinguish between the phosphorous or potassium in a 5-10-5 garden fertilizer on the one hand, and these elements as derived from natural soil minerals on the other. The gardener simply aims to have enough of these elements available at all stages of the plant's development, so he applies fertilizer that contains them in what is judged to be adequate amounts. As far as he is concerned, the plant can take it or leave it. Experience has shown that usually the plant takes it, and moreover profits by it. It grows larger and produces more bloom or fruit than it would have, if it had to acquire all its essential nutrients by the action of its roots and the organic fraction of the soil upon the relatively inert soil particles. That is the sole basis of the artificial fertilization of garden or field soils, though naturally a constant effort is made to approximate ever more closely the fertilizer mixture that the plant will use most profitably, having neither an excess nor deficiency of essential minerals. For the most part, however, the plant does its own selecting.

One difficulty of fertilizer applications at widely spaced intervals is that they provide more nutrients than needed all at once, and are subject to loss by leaching and run-off water and to appropriation by the myriads of soil organisms in the intervals between applications. They may even fail at critical times to meet the needs of growing plants. A better approach to ideal conditions would be to provide for constant renewal of each nutrient as it is used up. In some commercial establishments where crops are produced on an assembly line basis, especially where they are grown in solution cultures (hydroponics) the depletion of each major nutrient is followed by periodic analyses and just the right amount is then restored to the solution in which the roots grow.

Two recent developments in fertilizers for garden use give the small scale grower the ability to keep nutrient levels more nearly uniform and optimum than the practice of adding solid fertilizer only two or three times a year.

The first of these is the development of concentrated totally soluble fertilizers which, when suitably diluted, can be applied to the foliage of plants and are absorbed to some extent directly. This has been shown to occur with certain soluble forms of nitrogen, iron, and phosphorus. The plant gets a direct lift. To be sure, this only supplements the absorption of mineral nutrients by the roots. So-called "foliar feeding" can be repeated at intervals of one to four weeks throughout the growing season so that the plant remains on a reasonably uniform diet.

The second development is the production of high nitrogen fertilizers (up to nearly forty per cent) in which the nitrogen is chemically bound in a sort of plastic, and is only slowly released by the natural solubilizing and nitrifi-

cation processes in the soil. These nitrogen compounds are known under the general name "Ureaform", but are sold under a variety of trade names such as "Uramite", "Golden Vigoro", "Borden 38", and so on. They permit one to place enough nitrogen for the entire growing season within the plant's range at one time, but the plant can actually draw on it only as the nitrogen becomes available. The inert nature of the material eliminates fertilizer burning by the heavy application, and also prevents loss by leaching. To the plant it is something like having a constant annuity, with the checks coming in whenever the need arises. The "Ureaform" fertilizers are available both as single-element (nitrogen) products, and as mixtures containing phosphorous, potassium, and perhaps minor elements.

All experimentally minded rose growers should give foliar feeding and "Ureaform" nitrogen fertilizers a trial.

Pre-Emergent Control of CRABGRASS

By Irving B. McNulty

Mr. McNulty is Associate Professor of Botany, Division of Biology, University of Utah.

CRABGRASS is the No. 1 weed pest in lawns today. A native of Europe, it has spread rapidly in this country and now is found in all forty-eight states. Certain characteristics of crabgrass make it difficult to control, and being a very vigorous plant, it can compete successfully with desirable turf grasses. It is an annual grass rather than a broad-leaf plant like dandelion. Consequently, it is difficult to eradicate with selective herbicides—that is, herbicides that will kill turf weeds without doing permanent injury to grasses. When it grows in the lawn, it assumes a low spreading habit and escapes being cut by the lawn mower.

Crabgrass produces seed in prodigious quantities — even the smallest plants produce some seed. Over most of the country the seeds usually begin to germinate as early as February.

At present there are three methods of killing crabgrass with applications of herbicides:

One method utilizes chemicals that will kill the crabgrass plants *during germination*. However, crabgrass plants do not germinate all at once. While most of the seeds germinate in the spring, some germination will take place throughout the summer, even as late as September. Consequently, such herbicides must be applied at repeated intervals during the summer to insure adequate control.

A second method is to apply a selective herbicide on the lawn which will kill the growing crabgrass plants without excessive injury to turf grasses. Desirable broad-leaf turf plants, such as dichondra, are seriously injured by most of this type of selective herbicide. Many grasses are discolored and some, such as bentgrasses, may be injured.

A third method is to kill the crabgrass seeds *before* they germinate without injury to desirable turf grasses or dichondra.

One of the oldest pre-emergent herbicides of the third type used to control crabgrass is lead arsenate. A single application in the autumn or the spring kills the seed and thus prevents germination, eliminating the necessity of repeated applications. "PAX Crabgrass and Soil Pest Control", a commercial product containing lead arsenate as an active ingredient, has been on the market in the western United States for over fifteen years. However, the manufacturer wanted an even more effective product in the control of crabgrass and difficult-to-control soil pests, such as lawn moth larvae. Research provided the answer to this in a new combination of dry arsenicals and chlordane.

The research program, conducted during the past five years in Utah and California, developed the new formula which is now on the market as "PAX Crabgrass and Soil Pest Control" Improved with AR-76[1] and chlordane. Over a hundred combinations of arsenicals and other herbicides were tried in laboratory and field tests before the present formula was determined.

"PAX Crabgrass and Soil Pest Control" Improved with AR-76 and chlordane is a multi-purpose lawn treatment which not only effectively controls crabgrass by killing the dormant seeds, but also kills insect pests, including night crawlers, lawn moth larvae, grubs, cut worms, earwigs and ants. The product contains ammonium sulphate to provide nitrogen fertilizer.

The effectiveness of the new product was tested in California and in Utah under varying climatic conditions and found to be ninety to ninety-eight percent, when used according to directions and also superior to several applications of other chemicals commonly used for crabgrass control. The time of application is very important, as the new product must be in contact with the seed prior to germination, preferably for at least two or three weeks.

Fortunately, the AR-76 remains active for a long period of time so the product may be applied in the autumn, even before some of the seeds have ripened and fallen to the ground. As it kills the seeds on contact, the crabgrass will not appear the following season. Test plots in several areas of the country have remained free from crabgrass for three years now.

In tests conducted at the University of Utah during the past five years, a single application of "PAX Crabgrass and Soil Pest Control" was found to be superior to several applications of other chemicals commonly used for crabgrass control.

There are a number of advantages of "Pax Crabgrass and Soil Pest Control" Improved with AR-76 and chlordane. It kills the seed prior to germination and thus needs to be applied only once any time between Labor Day and the beginning of seed germination in the spring. It fertilizes the lawn and thus improves its appearance rather than discoloring it. Lawn-moth larvae, grubs, cut worms, earwigs, ants, night crawlers and other lawn pests are killed promptly with the new combination of dry arsenicals and chlordane. The product has the additional advantage of easy application with a fertilizer spreader without the need for measuring and mixing ingredients.

1—AR-76 is the manufacturer's designation of its combination of dry arsenicals used in the present "PAX Crabgrass and Soil Pest Control."

Another Stubborn Lawn Weed Succumbs

John Cornman and Robert G. Mower, of the Department of Floriculture and Ornamental Horticulture, Cornell University, Ithaca, New York have reported that "Endothal" (disodium 3, 6 — endoxahexahydrophthalate) at the rate of one pound in fifty to one hun-

(Continued on page 106)

OUR GARDEN LILACS

By **John C. Wister**

This is the address which Dr. Wister, Director of the Arthur Hoyt Horticultural Foundation, Swarthmore, Pennsylvania, delivered at the Twelfth Annual American Horticultural Council, held in Denver, Colo.

THE COMMON lilac, *Syringa vulgaris*, is one of the most popular garden shrubs. It succeeds in all but the warmest sections of this continent and grows particularly well in the colder areas. It prefers lime soil, but will tolerate acidity. It is so adaptable and so commonly seen, that it is often taken for granted and not given the prominent position and the attention it deserves.

The genus *Syringa,* which includes over twenty-five species, is one of about twenty genera belonging to the olive family. Its closest and best-known hardy relatives are the ash, forsythia and privet. The name *Syringa* is believed to have come from the Greek syrinx, meaning pipe, and is supposed to have referred to the mock orange *(Philadelphus)*, to which the name *Syringa* was first applied.

EARLY HISTORY

The history of the common lilac is fascinating. Augerius Giselenius Busbequius, the Austrian ambassador to the Sultan of Turkey during the sixteenth century, found it growing in the gardens of Constantinople. No one knew where it came from or how many years or centuries it had been grown. Busbequius introduced it to Vienna in 1554. By 1600 it was being grown in Holland and England. It was apparently well known in this country before the American Revolution. Its wild home was not discovered until about 1818, when it was found growing in the mountains of Hungary and Bulgaria.

In the nineteenth century, French, Belgian and German nurserymen raised seedlings and gave names to varieties that seemed new or desirable to them in color or form. Among the first of these men were Audibert, Billiard, Briot, Legraye, Leroy, Libert-Darimont, Simon-Louis, Spaeth and van Houtte. Records of their varieties are to be found in Mrs. McKelvey's monograph and in LILACS FOR AMERICA, the survey of the American Asociation of Botanical Gardens and Arboretums. Some of the oldest varieties, or at least plants now bearing their names, are grown in the great collections of the Arnold Arboretum, Jamaica Plain, Massachusetts, and of Highland Park, Rochester, New York.

Only a handful of these varieties are worthy from today's point of view, so fast has been lilac progress during the past fifty or seventy-five years. Over three quarters of the one hundred varieties recommended by the A.A.B.G.A. survey are originations of Victor Lemoine and his son Emile, Nancy, France, who introduced lilac varieties from 1870 to 1940.

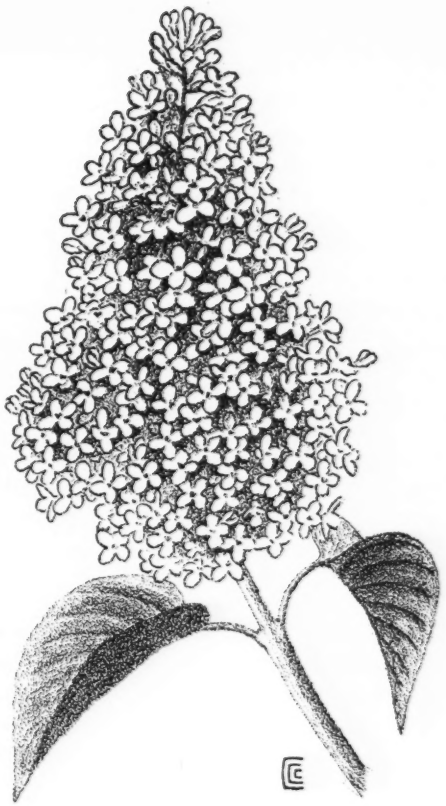
In the past quarter century, several American and Canadian breeders have made important additions. Among these are John Dunbar, of the Rochester, New York, park system; the late Theodore A. Havemeyer, a past president of the Horticultural Society of New York; Walter B. Clarke, San Jose, California; Edward J. Gardner, Horicon, Wisconsin; A. M. Brand, Faribault, Minnesota; Miss Isabella Preston, Ottawa, Ontario, and Dr. F. L. Skinner, Dropmore, Manitoba.

CULTURE

The culture of lilacs is simple. Plants will survive shade, bad soil and drought, but to produce the best flowers they require full sun, good soil and feeding, and yearly pruning after the blooming season. Pruning should be done to keep the plants shapely, to keep them within bounds, and to encourage the young growth for future years' bloom. Single stem plants are poor risks, because of the danger of borer attack. I prefer six to a dozen good stems and, as the plants get older, I cut out two or three of the largest each year. Crisscross growth should also be removed, and the plant should be opened up enough to allow sunlight to reach interior stems.

There are great differences of opinion on the merits of propagation by cuttings and by grafting. Most nurseries graft on ash or privet, and some graft on lilac seedlings.

It is claimed that, if planted deep, the scion of the graft makes own roots in a year or two. That is true of a



large number of the grafted lilacs. But how deep is deep? And how is the ultimate consumer to know whether the plant he gets is one of the large number with own roots, or the small number without?

Some nurseries lift the plant at the end of the first or second season and cut off the grafting stock. Then they sell the plants as own root, which they are, in spite of having originally been grafted. But how can the ultimate consumer, who is not a plant expert, know whether all the grafting stock has been cut off the individual plant he receives?

If ash or privet stock remains, it may send up suckers that the beginner will not notice and that may eventually kill the lilac. If lilac stock remains and sends up suckers, the gardener in a few years may have an inferior seedling instead of a fine named variety.

If the grafted plant has not made own roots in the nursery, it may still do so in the garden of its new owner. But if it does not, it will die after flourishing a few years.

A few nurseries prefer to propagate lilacs by budding. Apparently it is still cheaper, and the resulting growth quicker. The bud is above ground until the plant is sold, unless the nurseries

reset the plant deeply. If this is done, however, an extra year is required, which nullifies the commercial advantage of the quick growth. It seems to me unlikely that a good percentage of budded plants will make own roots after reaching the ultimate consumer.

Propagation by Cuttings

Cuttings are usually made of half-ripened wood in June. The old-fashioned method sometimes produced as many as ninety good rooted plants out of one hundred by autumn, if the cuttings were taken at exactly the right time. If cuttings were taken only a few days too early or too late, the percentage of success was small. The greatest commercial disadvantage of this method, however, is the number of years—three, four, five or more — needed to produce a three to four-foot or four to five-foot salable plant. This makes it necessary to get comparatively high prices for the plants.

With modern hormones, plastic tents, continuous mist, and so forth, good rooting percentages are higher and quicker. There are, however, still certain varieties that do not respond well enough to make the cutting method commercially practical. Furthermore, the slow aftergrowth remains the same, and this makes the resulting plants expensive. Until the gardener is willing to pay up to double for a plant grown from cuttings, few nurseries will be able to afford the method.

The amateur and the small nurseryman can produce plants quickly and cheaply from suckers, but this method does not lend itself to modern mass production. Propagation by seeds is easy, and if seeds are selected from good varieties, some of the resulting plants may flower well. The chances of getting a plant as good as, or better than, the seed parent is, of course, small.

Lilacs have few important pests. Scale insects are easily controlled by sprays. Lilac borer and leopard moth infestations may be discovered by watching for the borer sawdust. Carbon bisulphide or proprietary preparations may then be injected into the hole to kill the pest.

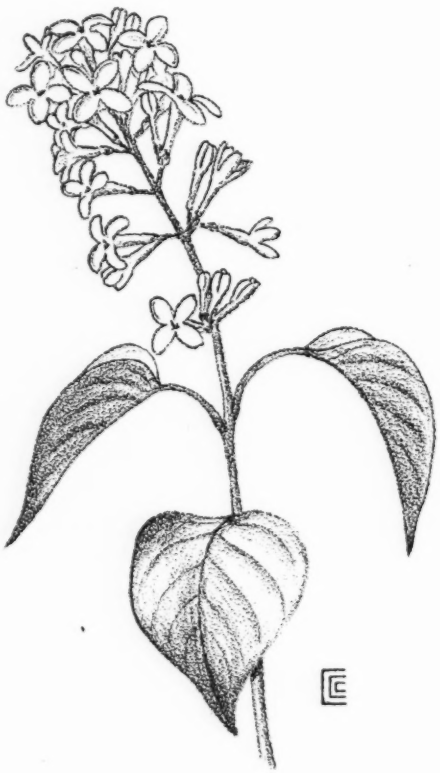
The larger digger wasp is often blamed for girdling stems in summer, but apparently the damage is actually done by the smaller European hornet. Experts advise wiping out the nests, but finding them is like looking for a needle in a haystack. I have not yet tried the triple-strength Japanese beetle spray containing derris dust that is recommended.

Damage from fungi and bacteria is occasionally reported, but it is not often serious enough to cause any great concern if the plants are well grown. Anything can happen in unsuitable locations. Cutting out and burning affected parts is a good standard practice for most troubles, and easier than spray programs.

A Selection of Lilacs

Choosing varieties is a difficult but fascinating task. Excellent guides are the A. A. B. G. A. lilac surveys of 1941 and 1953 which recommended one hundred varieties from the more than eight hundred listed. Beginners will do well to choose from this recommended list. Those who know lilacs may prefer varieties that at the time of the later survey were too little known to be fairly judged. In the following notes, all varieties, unless otherwise credited, are from Lemoine.

Selections should be made to secure a long season of bloom and a wide range of color. The first lilacs to bloom are the early hybrids. These were originated by Lemoine, who produced them by crossing the common lilac and *Syringa oblata giraldi.* Released first in 1911, the best-known varieties are 'Catinat', 'Lamartine', 'Louvois' and 'Montesquieu'.



In 1936, Skinner introduced a new and even more important set of hybrids. He used, instead of *Syringa oblata giraldi,* the broader, flat-topped and shorter Korean lilac, *Syringa oblata dilatata.* The Skinner hybrids retain those desirable characteristics. The best-known varieties are 'Assessippi' and 'Pocahontas'.

Still more recently, Clarke has introduced a giraldi set, the best of which probably is the pink 'Esther Staley'.

In planting, one should use more white than other colors to brighten the garden. The deep colors should be near the pale ones, and the pinks near the blues for contrast.

'Vestale' and 'Mont Blanc' have long been the two outstanding single whites. The best-known double white is 'Ellen Willmott'. A recent addition is 'Alice Harding'.

In violet shades, 'Cavour', 'De Miribel', and 'Marechal Lannes' are single; 'Henri Robert' is double.

In the bluish tints, 'Decaisne', 'Maurice Barres' and 'Firmament' are single, and 'Olivier de Serres' and 'President Grevy', doubles. The bluest of all is 'President Lincoln', which was developed by Dunbar.

Lemoine named his first introduction in 1870 'Jacques Callot'; this is still one of the finest of the common "lilac" colors. In lilac-colored doubles, 'Henri Martin' and the late-flowering 'Victor Lemoine' are outstanding.

It is not known who produced the oldest and palest pink variety, 'Macrostachya', but the pinkest pink, 'Lucie Baltet', came from one of the oldest of French Nurseries, Baltet Freres, of Troyes. One of Lemoine's first double pinks was 'Belle de Nancy'. Later pinks were 'Mme. Antoine Buchner' and 'Katherine Havemeyer'.

There are many magnificent lilacs in the magenta shades. Francisque Morel, a landscape architect and nurseryman of Lyons, named his best seedling 'Mme, F. Morel' for his wife. Among Lemoine varieties, 'Reaumur' is one of the most reliable for yearly bloom, and 'Paul Thirion' is particularly famous for its red buds. 'Capitaine Baltet' is the most reliable bloomer in the Swarth-

more College collection.

Fine single purple varieties are legion. The best known, perhaps, is 'Ludwig Spaeth' (originally, 'Andenken an Ludwig Spaeth', and later translated into French as 'Souvenir de Ludwig Spaeth'). Lemoine raised many fine purples; one not so well known as it should be, is 'Toussaint L'Ouverture'. Havemeyer introduced 'Mrs. W. E. Marshall', a rather small-flowering but intense red-purple. Good dark doubles are lacking.

I should like to add a few comments about novelties which, not yet widely known nor tested, seem most promising.

New single white lilacs are Lemoine's 'Fraicheur' and Dunbar's 'Henry Clay'. Just off white is 'Primrose', a sport from Marie Legraye grown at Jan Spek's nursery at Boskoop. In Holland and in England it is a true yellow. What it will be under the hotter American sun remains to be seen. Lemoine's 'Crepuscule' (which means twilight) is a most promising blue.

Since Havemeyer's death in the 1930's, a number of his seedlings from the variety 'Mme. F. Morel' have become available, though apparently never formally introduced by any particular nursery. There are certainly four outstanding varieties among these. 'Charm', year after year, has been proclaimed the finest of all lilacs at the Ewing Park Lilac Arboretum, Des Moines, Iowa. 'Glory', while admittedly somewhat unreliable in its blooming, has probably the largest flower. The spikes are so heavy they often hang down. 'Night' is the darkest and latest-blooming variety available, and 'Priscilla', which is much like 'Glory', is extremely free-blooming.

The variety raised by, and named for, the late Edward J. Gardner has shown itself a remarkably fine pink in the first few years of its trial at Rochester. It probably belongs with the early hybrids.

Three promising purples raised by A. M. Brand are the ones he named for himself, for Col. William R. Plum, and for Margaret Rice Gould, wife of the president of Carlton College.

A favorite of mine after more than ten years of trial is a variety developed by Dr. Casper Nelson, a Dakota medical professor, which has not yet been distributed. Much like 'Reaumur' in flower, its distinctive feature is its compact, symmetrical growth, a quality much to be desired and often sadly lacking in the finest lilacs. It bears the name 'Diane' in honor of the originator's granddaughter.

Further Improvement Needed

There is a need for a new generation of young lilacs breeders to carry on the work of Lemoine and the other breeders mentioned. No matter how fine the present finest varieties are, there is still not only room for improvement, but necessity for it. More compact and shapely plants are needed. Too many present-day varieties either spread or get too tall and ungainly, unless constantly and severely pruned. Needed also are comparatively dwarf varieties for today's smaller houses and gardens.

Plants should be more resistant to mildew and other fungi or bacteria, and yearly blooming should be more consistent. Some present-day varieties seem to give prolific bloom only every other year or only every third or fourth year.

I do not consider flower size highly important and am content that some varieties should have small spikes and flowers. But many gardeners will want still larger flowers. Clearer colors, I think, are necessary—bluer blues and, particularly, pinker pinks. Perhaps more brilliant red-purples and deeper blue-black-purples can be developed. Colors should not fade in hot sun as quickly as some do now.

A longer season of bloom is also desirable. This can be achieved through a greater flower substance, which would keep each spike in good condition longer in spite of hot sun or sudden heavy rains, or through the production of varieties that open earlier and those that remain in good condition later than present varieties.

In addition to all these desired qualities, the fragrance should be strong, and the varieties must be easy of propagation. If they are not, our modern mass-producing nurseries will reject them in favor of poorer sorts that are easier to handle.

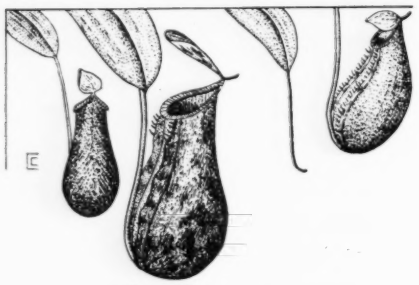
These requirements are many. The qualities will not be easy to achieve. Certainly they will not be easy to combine. Breeding will be a long job—five to ten years or more between generations. That, however, is no longer than the time required in the breeding of daffodils, peonies and rhododendrons. Daffodils and peonies require little space. Much can be done in the small backyard. Lilacs require more space than daffodils and peonies but not more than rhododendrons. Let it be noted that there are in this country today some dozens of rhododendron breeders, many of them amateurs with small gardens. It is clear that the known requirements for lilac breeding need not stop young or enthusiastic breeders.

For the amateur with the small garden, space requirements may seem the worst stumbling block. To make the crosses and grow the seedlings for two or three years, however, requires little room. After that, cannot the good offices of the American Horticultural Council be brought into play by putting the breeders in touch with nurseries, arboretums, botanic gardens, parks or state experiment stations that have ample space? Could not some of these line out, even a foot apart, one hundred or one thousand seedlings a year and grow them on for ten years or so while they are being judged and the few outstanding ones selected? I do not think the cost would be prohibitive.

GRAFTING OPPORTUNITIES (from page 93)

nurseries. Pear and quince have been grafted here on the black chokeberry, *S. melanocarpa* (or *Aronia melanocarpa*, in older literature).

Taxodium, bald cypress. The *T. distichum* native to southern Illinois swamps can be grown on dry land anywhere in the state that lime content is not too high. On good soil it grows rapidly. Spring bark grafts also are practical to graft on it both *T. ascendens* (pond bald cypress) and the dawn redwood *(Metasequoia)* though the dawn-redwood may not prove permanently compatible. The latter species, a "living fossil" from China, is variable, one of the finest clones being "No. 9" at the U.S. National Arboretum. Several other trees there and one planted by the late Professor Buckholz at the University of Illinois in Urbana have cones in 1958. *Taxodium,* like *Metasequoia,* is also readily rooted from summer cuttings, according to Rocknoll Nurseries, in Ohio. Midwest interest is increasing in *T. ascendens* which appears to have certain advantages over *T. distichum* in landscape work, both in habit and apparent resistance to foliage discoloration sometimes evident on the latter in some Illinois soils.



A Country Housewife's Garden

By **Gertrude B. Foster**

Mrs. Foster is Editor of the HERB GROWER MAGAZINE.

LAST SPRING we enumerated the herb species in our garden, over two hundred, and made a plan of the twenty-five beds with lists of varieties in each. Here we thought was the answer to people who walked about the garden asking, "What is that, how do you use this?" At the time there was one plant we couldn't name. It was similar to a number of neighboring sages so we didn't worry about leaving it off the list, not having positive identification.

By the middle of July, when visitors began to arrive in numbers to see herbs growing in a garden, the mystery plant had grown up and begun to bud. As soon as the reddish purple blossoms opened, we had a star on our hands. Every guest in the garden gravitated towards it with the inevitable question, "What is that lovely plant?"

The leaves were not fragrant like many of the salvias, but they were arranged in opposite pairs on the square stems. Obviously it belonged to the mint family. The half-inch long blossoms, arranged along one side of the stem in a dense spike, were two-lipped, another sign of its mint-kinship. The whole plant was two feet tall, and almost two feet in diameter, with many branching stems clothed with three-inch long, obtuse, crenate-margined leaves. From the opening of the first flowers until the last killing frost, this singular specimen was the most striking color spot in the whole green garden. No other plant bloomed so continuously with no seedy effect during its long season.

I remembered that it was one of several choice herbs given to me by Mrs. Mortimer Fox from her garden of rarities in Mt. Kisco, New York, The label had been lost over the winter. In the spring, the hardy perennial looked like one of the familiar denizens of the garden, but by August it was urgent to find a name for it. Still convinced that it was a salvia, too new to be mentioned in Mrs. Fox's book, THE YEARS IN MY HERB GARDEN, I sent a sprig to "Plantation Gardens" in Rustberg, Virginia. I knew that many of the unusual listings in their herb catalog had come from sources given to them by Mrs. Fox. They offered twelve biennial or perennial salvias; surely the purple beauty would be among them. To my great surprise, Mrs. Chalfin the owner of "Plantation Gardens," wrote that our elegant plant, which was growing in her garden, was listed in her catalog not as a salvia but as *Teucrium hircanicum*. It is Persian germander.

It had never occurred to me to compare its blossoms with the little, glossy-leaved germander, used so often in herb gardens as a neat edging. When I did, it was easy to see the similarity in shape; though the ten-inch tall plant has pink flowers, they are arranged in the same way on one side of the blossom spike. The leaves are very different in texture and color. As the dwarf germander, *Teucrium chamaedrys* is very pungent and the wrinkled-leaved taller one almost scentless, no relationship was suggested by handling the plants.

Here was proof again of the value of the binomial system which depends upon the blossoms for classification. But it also reminded me of the pleasure of growing a number of species of the same genus to discover the curious divergencies occurring in different parts of the world. "Plantation Gardens" offers five *Teucrium* species in seed. I shall try the hardy ones in the garden. *T. fruticans* I have been fortunate enough to enjoy for several years as another gift from Mrs. Fox's garden. It is a tender, trailing-stemmed, gray-leaved plant with blue blossoms which also seems surprising to be related to the gout-herb, germander, used instead of dwarf box in northern gardens. *T. fruticans* must be wintered indoors, and seed is not generally available.

Several of the *Teucrium* species enjoyed an ancient reputation for relieving the aches and pains of rheumatism and gout. They are listed in the twentieth century U.S. Dispensatories but not with the expectation of being used today. Columbine, *Aquilegia vulgaris*, is also listed there, as it was once used as a diuretic and diaphoretic.

Part of the fun of including the showier garden flowers in the herb garden is the reaction of visitors. Because so many of the plants there can be pointed out as salad herbs, meat seasonings, rose jar ingredients, and so forth, visitors immediately develop the attitude which Sir James Edward Smith deplored in the early nineteenth century. He was one of those who helped to make botany a separate subject from medicine. In his book AN INTRODUCTION TO PHYSIOLOGICAL AND SYSTEMATICAL BOTANY, he says: "Some people are ever enquiring 'what is the use' of any particular plant, by which they mean 'what food or physic, or what materials for the painter or dyer does it afford? They look on a beautiful flowery meadow with admiration, only in proportion as it affords nauseous drugs or salves. Others consider a botanist with respect only as he may be able to teach them some profitable improvement in tanning, or dyeing, by which they may quickly grow rich, and be then perhaps no longer of any use to mankind or themselves".

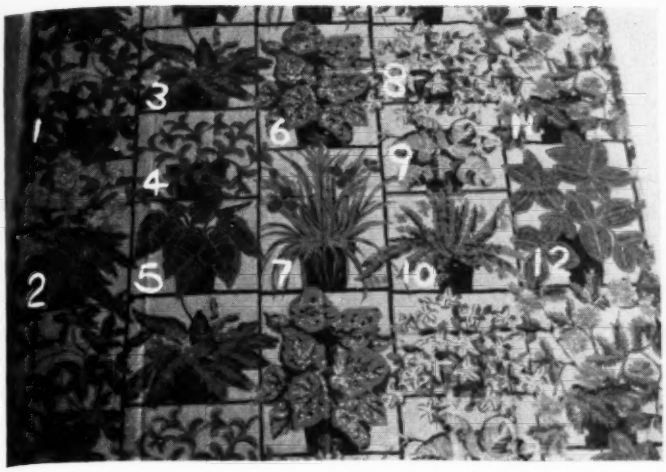
Of course, it is a matter of pride with herb fanciers to be able to furnish some tale of original use with every plant grown, but we should keep our sense of humor about it, for we find ourselves coming full circle with an earlier day.

LAWN WEED (Continued from page 102)

dred gallons of water per acre will control the tiny creeping *Veronica filiformis* that has invaded many lawns in upper New York State.

This veronica, with tiny pale blue and white flowers on slender stalks and scalloped leaves, was once considered a plant for rock gardens — till rock gardeners learned how much precious ground it will encroach upon. Evidently, it escaped from cultivation, for now it is a widespread nuisance in lawns in localities where there is no record of its having been introduced.

"Endothal" is now available in pint packages for home gardeners, and the label gives instruction for its application on small areas. Properly applied "Endothal" will rid the lawn of *Veronica fiilformis* without killing the desirable grasses.



House plant design fabric #13291 — sample 03 from the drapery collection of Jack Valentine Inc., New York City, decorator fabrics house — in color, combinations of blues, greens, yellows; additional colors on other samples.
Plants as numbered are: 1. *Parthenocissus henryana* 2. *Crassandra infundibuliformis* 3. *Episcia fulgida* (sport of) 4. *Zebrina pendula quadricolor* 5. *Anthurium crystalinum* 6. *Begonia* Rex hybrid 7. *Tillandria cyanea* 8. *Campanula isophylla* 9. *Kohleria* 10. *Lockhartia pallida* 11. *Mimosa pudica* 12. *Geogenanthus undatus.*

PLANTS IN FABRIC DESIGNS

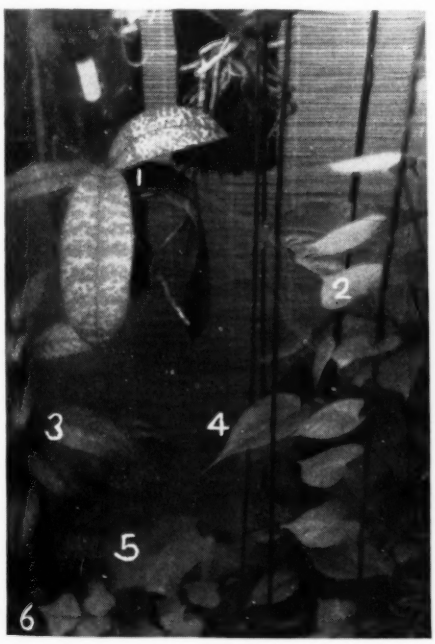
Norman Ruskin does free-lance designing in which the application of decorative flat design is suitable for the various home furnishing trades. Many of his intriguing designs have been created from his house plants, which he collects from a scientific as well as aesthetic point of view. His collection consists only of species, which he prefers designwise. However, under certain circumstances, he may resort to hybrids for their unusual form or color of foliage or flowers.

Certain of his plants, which are rather particular about humidity, are grown in a Wardian case—48" long x 30" high x 9½" deep. This is lighted by two 40-watt fluorescent tubes and has a reflector 48" long. Very little sunlight is available. The rest of his plant collections are contained in two plant stands in his New York City apartment. The bottom shelf of one of these stands, equipped with a 150-watt incandescent bulb, is used to raise seedlings and cuttings. The bulb is from thirteen to fifteen inches from the little plants—rather good germination is obtained.

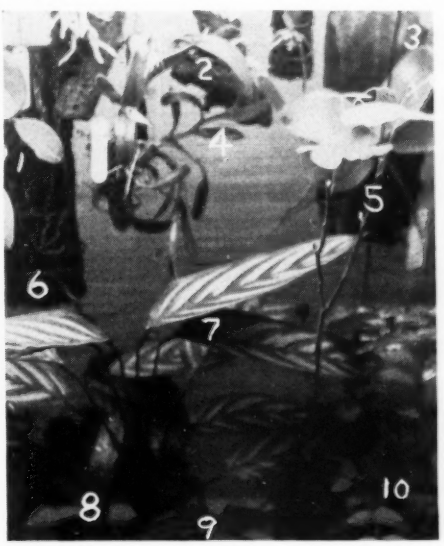
Mr. Ruskin's collection of house plants consists mainly of orchids, aroids, maranta and relatives, the ginger family (Zingiberaceae), the tradescantia clan, begonias, gesneriads, draceanas and some ferns.

One of the illustrations is of the house plant design fabric #13291-Sample 03 from the drapery collection of Jack Valentine Inc., New York, in color combinations of blues, greens, yellows, and additional colors on other samples. Jack Valentine Inc. is a decorator fabrics house.

1. *Phalaenopsis schilleriana.* 2. *Calonyction aculeatum* 3. *Strobilanthes dyerianus* 4. *Philodendron oxycardium* 5. *Hibiscus paramutabilis* 6. *Erythrina herbacea.*



1. *Cattleya aclandiae* 2. *Aerides japonica* 3. *Phalaenopsis lueddemanniana* 4. *Epidendron difforme* 5. *Bauhinia purpurea* 6. *Polyrrhiza lindeni* 7. *Ctenanthe oppenheimiana* 8. *Rhoeo discolor* 9. *Maranta bicolor* 10. *Cassia fistula* (seedling)



BOOK REVIEWS

NEW WAYS WITH DRIED FLOWERS, Ruth Gannon. 136 pages, illustrated. The Studio Publications, New York. 1958. $4.75

Ruth Gannon's handsomely illustrated book on dried materials and their arrangement is well organized to give all essential information on the subject in a manner which makes it a valuable and easily used reference book, as well as a volume for pleasant and informative reading.

The photographic illustrations—many of prize-winning compositions by top-flight arrangers—provide examples of many types of dried material, arranged in a multitude of ways.

Separate chapters on the main sources of supply—annuals, perennials, trees, shrubs, vines, vegetables, wildlings and exotics—are followed by instructions on preserving color and form. Each plant listed and described is accompanied by a key letter which tells the novice whether it should be dried by simple hanging upside down or rightside up; or whether it needs the longer and more delicate process of drying in sand or borax and cornmeal. Of course, the glycerine method of preserving branches of trees and shrubs is also described, as well as pressing, for use in dried plant pictures or panels.

A chapter on making screens, mats and lamp shades by pressing leaves between sheets of plastic is of special interest, and is clearly illustrated with "how to do it" pictures. These, together with ingeniously beautiful Christmas decorations, are ways in which most lovers of plants would like to use dried materials.

A number of books have appeared recently on this subject of drying for arrangement, but no matter how many others the enthusiast may have, she will want this one as well. It is, at the same time, comprehensive enough to be the one book on the subject in the garden libraries of many flower lovers.

ESTHER C. GRAYSON
Orleans, Massachusetts

THE ART OF FLOWER AND FOLIAGE ARRANGEMENT. Anna Hong Rutt. 248 pages, illustrated, indexed. Macmillan Co., New York. 1958. $5.95

This book, writtten as a textbook suitable for a college course, gives deserved importance to the art of flower arranging. Throughout, emphasis is placed on principles of design, applied to art elements, both in flower arranging and other forms of art with similar aims—to attain "beauty, expression and suitability". The first chapters present fundamentals of design and vocabulary used in flower arranging; the remainder of the book shows application of these fundamentals to arrangments of varying types.

There is an excellent chapter on "expressiveness", demonstrating how to carry out themes in arrangements, and suggesting themes for flower shows. A fine chapter on period arrangements relates flower arrangements of the period to paintings of the period. Another very helpful chapter lists methods of conditioning many commonly used flowers, based on recommendations by the author's Japanese teachers of flower arranging. A guide for beginners purchasing their first containers should be of special help to them. Concluding chapters of the book cover the making of a flower arrange-

(Continued on page 111)

NEWS, NOTES and COMMENTS

In-Service Course for Teachers at The New York Botanical Garden, which started on February 18, 1959, and will end on June 10, 1959, has an enrollment of two hundred and thirty-one. This course is given by the Garden in cooperation with the Office of Elementary Science and School Gardens of the Board of Education of the City of New York. T. H. Everett, Curator of Education and of Horticulture, conducted three sessions on "Fundamentals of Plant Culture" —soils and soil substitutes, air and water, temperature and light; Louis P. Politi, Horticulturist, three sessions on "Indoor Plants" —their care and culture, propagation, selection and display; Dr. P. P. Pirone, Plant Pathologist, two sessions on "The Science of Disease and Pest Control"—recognition and diagnosis, prevention and cure; Howard W. Swift, Assistant to the Curator of Education and of Horticulture, three sessions on "Outdoor Plants"—choice and care of ornamental trees, bulbs and perennials, and annuals.

Single sessions are being taught by J. H. Beale, former arboretum superintendent of the Boyce Thompson Institute for Plant Research, on "Outdoor Plants"—shrubs, their care and culture; Harold Epstein, President of the American Rock Garden Society on "The Fun of Growing Unusual Plants"; Mrs. Lillian Weber, instructor in the Garden's Educational Department, on "Planning and Managing Children's Gardens"; and Mrs. Jeanette M. McDowell, who is associated with the Office of Elementary Science and School Gardens of the Board of Education, on "Horticulture and the Curriculum".

Horticultural Courses for 9th District at the Garden. On February 25, 1959, the first of a series of horticultural courses, specially directed to the horticultural chairman of each club within the 9th District of the Federated Garden Clubs of New York State, Inc., began at the Garden. The courses, held 9:30 - 11:30 A.M., the first Wednesday of each month, are conducted by T. H. Everett, Curator of Education and of Horticulture at The New York Botanical Garden. Mrs. S. Gilbert of Larchmont, New York, who is in charge of arrangements and registration, has felt for some time that garden clubs have been devoting too little time and thought to horticulture as compared with flower arranging. Yet, basically, a garden club's responsibility is to impart some horticultural information to its members. Perhaps this neglect has been due, in part, to lack of knowledge and enthusiasm, and glamor, too, in delivering the information. The method of approach must be improved›

Heretofore courses have been given over a period of a few weeks or months in which case the student would take notes on operations to be done three, four or even six months later. Under the present course, the student gains first-hand knowledge of the operations to be practised immediately—or almost immediately—on plant material that is blooming, or about to bloom, at the time of study.

An important feature is the mimeographed copies of the day's lecture to be given by the student as a ten-minute or more program before her particular club.

While the course was set up for the horticultural chairman of the 9th District Clubs, it is open to others. Fee for the ten sessions is twenty-five dollars.

Seventeenth Annual Rose Day at The New York Botanical Garden will be held on June 10, 1959. Dr. P. P. Pirone, Plant Pathologist, will discuss rose diseases and pests and their controls in the afternoon session which will take place in the Lecture Hall of the Museum and Administration Building; T. H. Everett, Curator of Education and of Horticulture, will be moderator of the panel of experts. Mme. Josui Oshikawa, founder of the Sho-Fu-Ryu Flower Arrangement School in Tokyo, will demonstrate the use of roses in Japanese flower arrangements.

"Guest experts" will be in the Rose Garden from 9:45 - 11:45 a.m., to answer questions. Howard W. Swift, Assistant to the Curator of Education and of Horticulture, is chairman of the committee of guest experts; Mrs. Dorothy Ebel Hansell, Editor of the Garden Journal of The New York Botanical Garden, is in charge of the arrangements for Rose Day.

Dr. Arthur Cronquist, Curator of The New York Botanical Garden, left on March 20, 1959, for extensive field work in southeastern Oregon. Enroute he paid a visist to son John, in his first year at Duke University; to Pomona College at Claremont, California, to become acquainted with the Marcus Jones Herbarium which has a notable collection of plants of the Great Basin and allied areas; and to Rancho Santa Ana Botanic Garden, also at Claremont.

Dr. Cronquist also stopped at Logan, Utah, to confer with Dr. Arthur H. Holmgren of the Department of Botany, Utah State University, on plans for collaboration on an Intermountain Flora; and at Seattle, Washington, to confer with Dr. C. Leo Hitchcock of the Department of Botany, University of Washington, on plans for the completion of the Northwest Flora.

He picked up his camping equipment and field gear at Pullman, Washington, where he was joined by Dr. Marion Ownbey of the Department of Botany, Washington State College, and started his field work in southeastern Oregon on April 10. Dr. Cronquist will return the middle of August in time to participate in the International Botanical Congress, where he will chair a symposium on systems of classification.

CHANGES AT THE GARDEN

As we go to press, Dr. William C. Steere, Director, has announced that T. H. Everett has been appointed Assistant Director for Horticulture— Mr. Everett will continue as Curator of Education; that Howard W. Swift has been appointed Assistant Curator of Education; that Rupert C. Barnaby has been appointed Honorary Curator of Western American Botany.

Dr. Steere has also announced that the Downtown office of The New York Botanical Garden has been discontinued as such and hereafter will be the office of the Volunteer Associates, with Miss Tina Carbone continuing as Executive Secretary. Mrs. Mildred Saffell has resigned as assistant to the president of The New York Botanical Garden, Charles B. Harding, to become executive director of Variety Clubs, Inc., of New York, and its Cancer Research Control Foundation. Mrs. Eilene Kene has been appointed Membership Secretary and will handle all areas concerning membership activities.

VASCULAR PLANTS OF THE PACIFIC NORTHWEST, Vol. IV, of which he is author, was published in March 1959.

Dr. John Wurdack, Associate Curator of The New York Botanical Garden, accompanied by Lincoln Adderly of the Gardening Department, is collecting flora of the rainy season for botanical study in Venezuela, along the upper Orinoco. It is anticipated that collection will also be made of some plants that will prove of interest for cultivation in gardens of the United States.

This expedition, which extends from April through August, is being made by The New York Botanical Garden in cooperation with the Servicio Botanico of the Venezuelan Government.

National Science Foundation Grant has been given to The New York Botanical Garden to conduct a summer training program in biology (research) for fifteen senior high school students. Final selection of the students will be made by staff members of the Garden from candidates recommended by science high schools in New York City.

This is one of the grants to a total, approximately, of $1,600,000 being made by the Foundation for one hundred and twelve secondary school training programs to be carried on at one hundred and five colleges, universities and non-profit research organizations in thirty-five states, the District of Columbia and Puerto Rico. The program is designed to provide high school students of high ability with the opportunity to participate on a college - level program of classroom lectures, laboratory work and research.

The program at The New York Botanical Garden, July 6-August 7, 1959, will be directed by Dr. David Rogers, Curator of Economic Botany. Dr. Bassett Maguire, Head Curator and Coordinator of Tropical Research, Dr. Clarke T. Rogerson, Curator of Cryptogamic Botany, Dr. P. P. Pirone, Plant Pathologist, Dr. Richard M. Klein, Alfred H. Caspary Curator of Plant Physiology, T. H. Everett, Curator of Education and of Horticulture, and Dr. Annette Hervey, Research Associate, will instruct in their respective areas.

"Ecology of the Redwoods" was the topic of an open meeting of the National Parks Committee and the Redwoods Committee of the Garden Club of America, held in the auditorium of the French Institute, New York City, on March 18, 1959. Eivind Scoyen, Associate Director of the National Parks Service, and Dr. David D. Keck, Assistant Director (on leave) of The New York Botanical Garden, gave illustrated talks, and Miss Elizabeth Hall, Librarian of The New York Botanical Garden, arranged a very comprehensive exhibit of literature bearing on the subject.

Mrs. Harold I. Pratt was selected by the Park Association of New York for the 1958 citation of merit, because of her contributions to the development of The New York Botanical Garden, her fund-raising activities for the Park Association, her donation of park land to Glen Cove, Long Island, and her support of Garden Club of America projects. The scroll was presented at a luncheon at the "Tavern on the Green" in Central Park, New York City, April 28, 1959, which was attended by Dr. William C. Steere, Director, Dr. H. W. Rickett, Acting Assistant Director and Bibliographer, Robert F. Kolkebeck, Assistant Director and Business Manager, A. C. Pfander, Admini-

strator, Henry de la Montagne, Assistant Director Emeritus, and Mrs. Dorothy Ebel Hansell, Editor of the Garden Journal of The New York Botanical Garden.

Robert Moses, Chairman of the New York Power Authority, Chairman of the New York State Council of Parks, Commissioner of Parks of the City of New York, member of the Board of Managers of The New York Botanical Garden, has been honored by having the power dam on the U.S. side of the St. Lawrence Power Project named the Robert Moses Power Dam.

"Desert Peak Sands Yield Message after Thirty-four Years!" Under this heading a story appeared in the February 12, 1959, edition of the Daily Press, Riverside, California, relating how a group of the Peak Section, Angeles Chapter of the Sierra Club, had found at the top of Little Bordo Peak in the Pinyon Wells area a rusted can containing this message: "December 29, 1924. We started for Ensenada in lower California and ended up here camping at Pinyon Wells. Snow on the hillside in small patches. Edmund Jaeger, Lank Osborne, David Keck."

Dr. Edmund Jaeger is retired Riverside City College instructor and a noted desert naturalist; "Lank" is Dr. Ernest G. Osborne, head of the Department of Sociology at Columbia University; and David Keck is none other than Dr. David D. Keck, Assistant Director (on leave) of The New York Botanical Garden, now serving as program director for systematic biology, National Science Foundation.

Loretta Pirone is the name of a new dahlia named in honor of the gracious wife of Dr. P. P. Pirone. It was developed by Albert Parrella, well-known dahlia hybridizer and owner of the Parrella Dahlia Gardens in the Bronx, New York City.

The flower color is a blend of Empire Yellow and Capsicum Red, is 8 x 4 inches on 8 to 10 inch wiry stems.

The New York Botanical Garden's Exhibit at The International Flower Show received several outstanding awards. The Bulkley Medal of The Garden Club of America was awarded "for the presentation of its Shaded Garden which is pleasing in its design and in the excellence of its plant material. Its educational value lies in the use of plant material which is readily obtained in local areas." The special bronze medal of the Federated Garden Clubs of New York State, Inc., for the International Flower Show was awarded to The New York Botanical Garden "for an outstanding educational exhibit", as was the T. A. Weston Memorial Trophy. The exhibit also received the gold medal of The Massachusetts Horticultural Society awarded "to the exhibit receiving the most points in the group."

The "Shaded Garden" was beautiful in design and execution, in the planting thereof, in the selection of suitable material, and in the skill displayed in forcing choice items. Louis P. Politi, Horticulturist, and the men and women of his department are to be given full credit for a job well done, including the labeling of the plant material and the preparation of a keyed list of plants and a comprehensive list of plant material that can be grown under shaded conditions.

Typical of the praiseworthy comments are the following excerpts from letters—the first addressed to Dr. William C. Steere, the other two to Mr. Politi.

"I have been an attendee for many years now of the International Flower Shows, at the New York Coliseum recently and other locations in years past. They are inspiring, of course, beautiful, and many of them most ingenious in their constructions, arrangements, etc.

"It is so difficult to say which is "the best" nor for that matter is it important to do so. Each, in its own way and manner, has much to offer in design and beauty.

"The exhibit of The New York Botanical Garden is a joy to behold and possesses charm and a naturalistic beauty, and with it all is most instructive and educational. I have seen it for the third time since the Show opened and the people with me on each occasion, joined me in saying that it is postitively inspirational and definitely "the best".

"The people of the City of New York and the many others outside of the City, owe a debt of gratitude to The New York Botanical Garden, and more specifically to those who made that exhibit possible."

J. A. LUKINS
Port Chester, N. Y.

"My warmest congratulations on the beautiful shady plant garden at the Flower Show. I was at the flower show dinner and was thrilled to hear all the honours received by The New York Botanical Garden. I have really never seen a lovelier garden and those tiny hellebores were exquisite. I had never seen ones as small as that.

"I do congratulate you for such a beautiful and instructive exhibit and for all you did to bring it about."

ANGELA M. PLACE
Mrs. Hermann G. Place
New York, N. Y.

"I could not let this day go by without telling you how greatly I enjoyed your garden at the International.

"It was such a spot Tennyson had in mind when he wrote 'The Brook'."

Sincerely
ANABEL LASKER
Mrs. Samuel Lasker
Scarsdale, New York

Plants from Great Britain. The following letter was addressed to T. H. Everett, Curator of Education and of Horticulture at The New York Botanical Garden.

"In your article in the Jan.-Feb. 1959 number of The Garden Journal, you mention a yellow form of *Gloriosa superba*, and say it is of "unknown origin". You may be interested to know that this yellow gloriosa grows wild in the Swaziland bushveld. I have seen it a good many times; but it is not a common wild flower, just solitary plants here and there. It grows in the grass amongst small bushes and shrubs, with a cool root-run and head in the sun. As it is protected, I have none of the rhizomes or tubers or whatever they are called; though I have some of the ordinary orange and yellow gloriosa growing in the garden. These I got on the Coast of Natal, where they grow in great profusion, especially in the places where the bush has not been cleared. They grow right down to the edge of the beach, sometimes in what looks like pure sand.

"You also wrote of *Clerodendron bungei*; it likes this climate so much that it is almost a pest, popping up all over the place and taking posession of flower beds if not carefully watched. I have *C. thomsonae, C. speciosum* and *C. ugandense* in the garden; the last I have not seen listed in either my encyclopedia of gardening or in EXOTICA, so I wonder if it has a different name now. Its common name is Oxford and Cambridge shrub because of its flowers of light and darker blue. It seeds easily — and if you would like seeds, I can send you some. I got my plant from the Botanical Gardens in Pietermaritzburg, Natal.

"We have many very beautiful wild flowers, and flowering trees and shrubs in Swaziland — the Kaffirboom, *Erythrina caffra,* with brilliant scarlet flowers in winter; many acacias (thorn bushes); *Adenium multiflorum*, (the Impala lily, though, of course, it is not a lily at all); *Schotia brachypetala* (the tree fuchsia); *Bolusanthus speciosus* (the tree wisteria); *Bauhinia galpini* ("Pride of de Kaap") with extremely showy orange-red flowers. To mention just a few amongst the bulbs are yellow and pink arums *(Zantedschia)*; *Colocasia* (elephants-ear); *Littonia modesta; Haemanthus* (snake-lily); *Crinum*; *Cyrtanthus* (firelily); watsonias and clivias. Professor Compton,

The Shaded Garden of The New York Botanical Garden was the outstanding exhibit at the International Flower Show, New York City, March 1959.

Above, Floribunda rose 'Fire King'.

Left, Floribunda rose 'Sarabande.'

who used to be director of the National Botanic Gardens near Capetown before he retired, is at present doing a botanical survey of Swaiziland for the government which should be most interesting when finished.

"I like the Garden Journal very much — a year's subscription was paid for me by a friend in Ohio; I have had two numbers already and am looking forward to others."

MARGARET S. VAN HEERDEN
(Mrs. C. J. van Heerden)
Bremersdorp
Swaziland, South Africa

Letters of Appreciation: The following letter dated March 17, 1959, was addressed to Henry de la Montagne: "Your very kind note and copy of the resolution of the Board of Managers of the Garden in memory of Father was waiting for me on my latest trip to New York. On behalf of all of Father's family, I wish to convey to you and to the Board our very real appreciation for such a wonderful commemoration of Father's warm and active connection with the Garden over a period of so many years.

Father was a man of great intelligence, of strong action and of great integrity, and his participation on your Board gave him full scope for all of those qualities.

It is most pleasant to think of this connection being so beautifully phrased and of having it thus publicly recorded for posterity.

It is also nice to think that Father's last day out was the one spent in carrying wine or something up to the men at the Garden— December 19th I believe it was."

C. MCKENZIE LEWIS,
Pittsburgh, Pennsylvania

The following letter dated March 17, 1959, was addressed to Dr. William C. Steere: "I am very happy to acknowledge receipt of the March-April issue of The Garden Journal and also to express our thanks and gratitude to you for your warm friendship and understanding.

"We are also very thankful to you for including in the issue on page 74 reference to your relations with Bar-Ilan University and particularly the Solomon Weinstein Chair of Botany. . . . . .

M. MORTON RUBENSTEIN,
Director of Development,
Bar-Ilan University

All-American Rose Awards for 1960. Two Floribundas and a Hybrid Tea won the All-America Rose Awards, according to the announcement of the All-America Rose Selections, Inc. 'Fire King,' a tall-growing Floribunda, will be particularly useful for general garden use and landscaping. Its brilliant vermillion flowers, two to three inches wide, are borne in heavy clusters. Dark green foliage fills out the strong-growing plant to a well-rounded, compact appearance. 'Fire King' is an origination of the late Francis Meilland. 'Sarabandi', the other Floribunda, has blooms somewhat larger than average and their color is a unique scarlet-orange. Because of its low, compact form, it is particularly suitable for border edgings and hedges. 'Sarabandi', also originated by Meilland, starts to flower early and continues flowering throughout the season.

'Garden Party', the result of a cross between 'Charlotte Armstrong' and 'Peace', is a free-branching, vigorous plant that bears a succession of its cream and ivory flowers, tinted with soft pink, over a long season. The large, fully double blooms often measure as much as seven inches across and are carried on long, sturdy stems.

International Horticultural Exhibition, "Floriade-Rotterdam 1960", is scheduled to open March 25, 1960, and to continue through that fall. It will occupy one hundred and twenty-five acres set aside by the City of Rotterdam for this purpose. Two exhibition halls will provide one hundred and sixty thousand square feet of space for exhibits of flowers, shrubs, fruits, vegetables, gardens, and flower arrangements.

Ninth International Botanical Congress will be held in Montreal, Canada, August 19-29, 1959, and is expected to attract over two thousand botanists from seventy-two countries. Dr. William C. Steere, Director, will head the delegation from The New York Botanical Garden, which will include Dr. H. W. Rickett, Acting Assistant Director and Bibliographer, Dr. Clarke T. Rogerson, Curator of Cryptogamic Botany, Dr. Arthur Cronquist, Curator, and Dr. Caroline K. Allen, Visiting Research Associate.

The Royal Botanical Gardens, Kew, London, is celebrating its bicentennial this year, and it is anticipated that Queen Elizabeth will grace the garden party to be held there on June 2, 1959. Dr. William C. Steere, Director of The New York Botanical Garden, and Mrs. Steere have been invited by Dr. George Taylor, Director of The Royal Botanical Garden, to attend this event, and plan to do so.

Arboretum at Phillipsburg, New Jersey, High School. Seven years ago, Harry C. Mergenstern, managing director of the Phillipsburg Development Corporation, proposed that an arboretum be established on the grounds of the high school. His idea appealed to the Rotary Club which prepared and presented detailed recommendations to the Board of Education. The school board set up an arboretum committee including a member of the board, the principal of the high school, the commissioner of parks and recreation, and a member of the Rotary Club.

Several acres of school property, neglected and overgrown, were cleared. Existing trees in good condition were retained and identified by their botanical and common names. New trees and shrubs have been planted. Today over one hundred trees and shrubs occupy five acres, and it is expected that the planting will eventually cover eight acres.

A master plan was drawn up and, in most cases, the trees and shrubs are grouped according to the plant families to which they belong. There are different species of pine, hemlock, fir, holly, maple, linden, willow, locust, beech, birch, walnut, poplar, ash, dogwood and cherry. A prized metasequoia sapling was presented in spring 1957, and Rutgers University, Department of Ornamental Horticulture, sent a three-year-old Japanese heartnut tree which it had propagated. The Morris Arboretum donated saplings of nine species of oak, and a local nurseryman fifteen young evergreens.

Mr. Mergenstern's enthusiasm and interest have brought the project to its present healthy status. It has tremendous educational value in instilling an appreciation of the value and beauty of trees and shrubs in young people and in acquainting them with the plant's characteristics, so they will be able to recognize them. And, of course, the transforming of the neglected area into an attractive arboretum has also given pleasure to the residents of and visitors to Phillipsburg.

The Phillipsburg High School Arboretum has received state-wide and national attention, and several school districts are reported to be considering similar projects.

Antioch College is the proud possessor of a one thousand nature preserve, Glen Helen. Dr. Kenneth Hunt, Professor of Biology at the college and director of Glen Helen, recently appealed to the American Planning and Civic Association to help save the glen from having a proposed three hundred-foot, dual-lane, limited-access highway cut through it. Glen Helen serves not only the college, but elementary and high schol students, garden clubs and nature study groups, and is state-wide in importance, as there are no comparable areas. Roads, highways, industrial areas are necessary parts of economic growth and progress, but are "disastrous blessings if allowed to disrupt our few remaining remnants of native America."

Two New Episcia Cultivars. Two clones have been selected at Cornell University from the more promising plants of *Episcia* X *variabilis* from the original cross (*E. reptans,* formerly *E. fulgida,* and two different clones of *E. cupreata*). These have been given the cultivar names 'Filigree' and

'Shimmer'. Both have ornamental merit chiefly because of their foliage, though their flower color is pleasing as well. Stock has been released for propagation and commercial distribution.

Cleveland Bonsai Club. One of the recent outgrowths of a progressive history in horticulture in the Cleveland, Ohio, area was the formation of the Cleveland Bonsai Club in March 1956. Although its membership comprises a cross-section ranging from the novice to the professional horticulturist, its objective from the beginning has been a high standard in the craftsmanship, the culture and the appreciation of bonsai as related to the world today.

Regular meetings are held at the Garden Center of Greater Cleveland, from whose library literature can be obtained on the subject. One of the club's projects is a bibliography of reference material on bonsai and on the technical aspects of plant physiology and horticultural methods which pertain to dwarfing in plants.

Two exhibits of bonsai and "bonsai in preparation" from members' collections have been held in connection with the garden center events.

A section of the greenhouse has been made available to the Club at "Gwinn"—a local show place and conference center—and a permanent collection of bonsai is being built up there.

A. E. Luedy, one of the club's founders, who has been growing bonsai for nearly forty years, is editing "Bonsai Notes", a monthly paper with information on the culture of bonsai and news of the club.

Mrs. Beatrix Farrand, noted landscape architect and garden consultant, died at her home, Reef Point, Bar Harbor, Maine, on February 28, 1959, at the age of eighty-six.

Mrs. Farrand designed, among others, the gardens of Dumbarton Oaks, Washington, D.C., then the home of Mr. and Mrs. Robert Woods Bliss, now the Museum of Byzantine Art of Harvard University; the grounds of the Graduate College of Princeton, New Jersey; the Memorial Quadrangle at Yale University; the Santa Barbara Botanic Garden in California. She studied under the late Prof. Charles Sprague Sargent, Director of the Arnold Arboretum, Jamaica Plain, Massachusetts, and held honorary degrees from Yale University and Smith College. In 1947 she received the Garden Club of America achievement medal, in 1952 the Massachusetts Horticultural Society gold medal and the Distinguished Service Award of The New York Botanical Garden. It was in 1940 that the American Institute of Architects cited her as "one of America's distinguished landscape architects who has made an outstanding contribution to American culture through her achievements in creating harmonious and beautiful settings for buildings."

Mrs. Farrand had been a member of The New York Botanical Garden since January 1916 and took a particular interest in the Rose Garden. She presented the Beatrix Farrand Cup to the Garden to be awarded for the best exhibit of single roses at the annual Rose Day. Edward J. O'Keefe, gardener of "Red Oaks", the estate of Mrs. M. Newborg, White Plains, New York, won the cup three times and now holds it permanently.

BOOK REVIEWS (from page 107)

ment, Junior work, flower show entries and judging.

The author refers to the HANDBOOK FOR FLOWER SHOWS, published by the National Council of State Garden Clubs, as an authority and source book and, in most instances, agrees with material presented in it.

Many well-chosen illustrations add interest and would help the beginner to understand the text. However, this book seems geared more to the experienced exhibitor and flower arranger for whom it is a valuable source book and an inspiration.

ALICE KING
Chatham, New Jersey

CAMELLIA CULTURE. Edited by E. C. Tourje. 484 Pages, illustrated, indexed. Macmillan Co., New York. 1958. $11.50.

CAMELLIA CULTURE brings in focus almost all of the research to date on the genus *Camellia.* The volume itself belies the wealth of information it contains, unless consideration is given to the fact that fifty of the country's outstanding authorities from all regions where Camellias are grown, have merged their specific knowledge of these plants to present 484 pages of delightful reading, adequately supported by photographs and line drawings. Therein will be found practical and technical information so assembled as to suit amateurs and students alike.

In my opinion it surpasses anything so far published in its broad coverage of camellia culture, with many of its articles adaptable to the general field of horticulture, as, for instance, found under the subtitle of "soils," "nutrition" and "moisture". "Breeding and hybridizing" presents the last work in research in that field. Display, shipping and handling will interest the person who exhibits. The broad scope of propagation is adequately covered.

Mr. Tourje is to be congratulated on his skill of having edited a volume which could be called an encyclopedia of camellia culture by who's who in the camellia world.

FREDERIC HEUTTE
Norfolk Botanic Garden
Norfolk, Va.

500 ANSWERS TO YOUR FLORIDA GARDEN QUESTIONS. Wolfe, Herbert S., John V. Watkins, Thomas B. Mack. 120 pages, with drawings by Esther Google, indexed. University of Florida Press, Gainesville, Florida. 1957. $2.75

This is an excellent book for the amateur gardener living in Florida and for anyone planning to settle in this state, because here in the sub-tropics (the southern tip of the

The exhibit of the Cleveland Bonsai Club for "Garden Festival Day", held at the Garden Center of Greater Cleveland at "Gwin", June 1958.

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The three authors, Herbert S. Wolfe, John V. Watkins and Thomas B. Mack, answer many simple questions and provide ample gardening information (in book form) which has been greatly needed in the state of Florida.

MARTHA M. DOIG
Miami, Florida

THE LIVING FOREST. Jack McCormick. 127 pages, illustrated, indexed. Harper & Brothers, New York. 1959. $3.95.

Much more than trees, THE LIVING FOREST is nature's city, with a dense population in the different stories of numerous living plants and animals having many livelihoods. Emphasis is given to the life of the forest floor, forest insects, and plants causing tree diseases. Diagrams show the flow of energy through the forest, including food chains and the food web. Weather in the forest is well presented. Other chapters are devoted to stories a stump can tell, the forests of North America, and harvests by nature and by man.

Within this small volume much reference material not readily available has been assembled in popular form. The information is accurate and up to date, even to the illustration of the oldest authentically dated tree in the world, a bristlecone pine tree of California about forty-five hundred years old when cut in 1956. Photographs and drawings occupy nearly half the book. Some without legends would have told their message more effectively with legends, labels, or scales. Errors are few and too trivial to mention, except for the two interchanged drawings on page 112.

Readers will wish to visit at the first opportunity the new Hall of North American Forests at the American Museum of Natural History in New York City. The book is based upon this exhibit and the author's work in its preparation.

ELBERT L. LITTLE, JR.
United States Forest Service
Washington, D. C.

INTRODUCTORY HORTICULTURE. E. P. Christopher. 482 pages, illustrated, indexed. McGraw-Hill Book Co., New York. 1958. $7.50

Dr. Christopher has completed the difficult task of writing an introductory text covering the broad field of horticulture for home gardeners and beginning college students. In this book he discusses plant growth processes and structure and the influence of such factors as climate and soil on plant development. The bulk of the text, however, is concerned with cultural practices (and the reasons for them) which are associated with vegetable, floricultural, tree fruit, and small fruit crops, plus additional chapters on landscaping, nursery and arboriculture, plant disorders and pest control, and storage and marketing.

For the amateur gardener the wide array of subjects may have distinct advantages. However, one must recognize and expect that in one short volume some topics, of necessity, are given limited treatment. Regardless of this difficulty, this book can be recommended for the home plant enthusiast who wishes some information on a variety of subjects.

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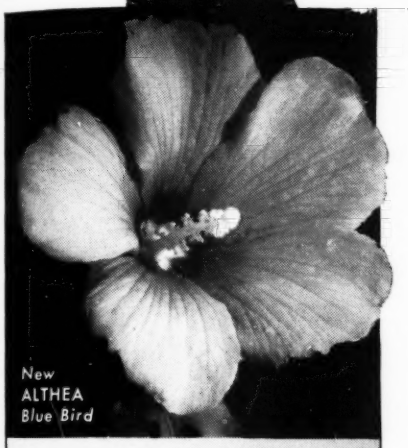
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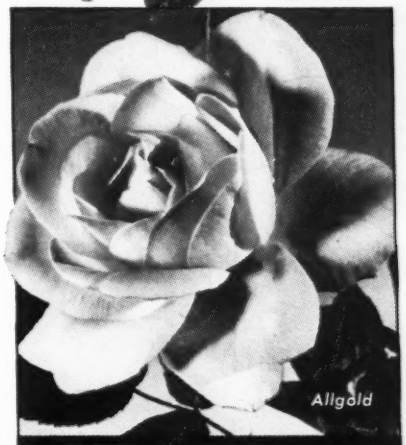
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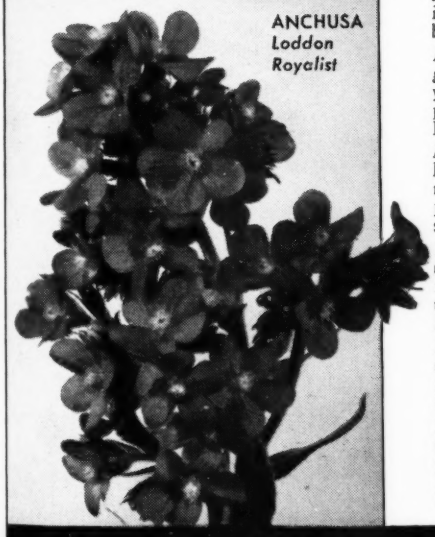
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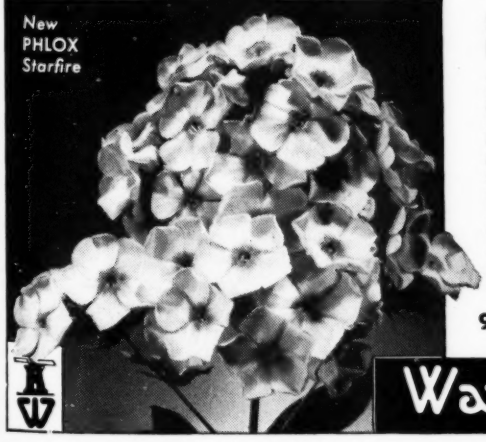
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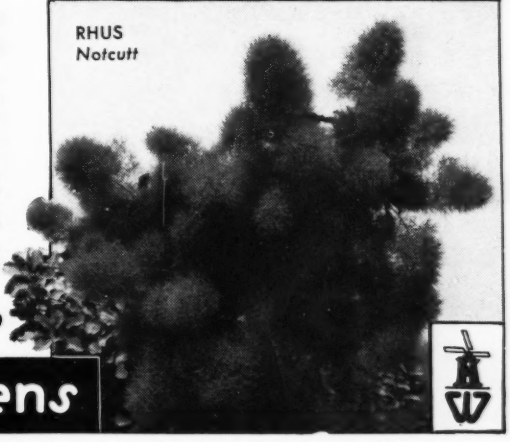
PHLOX
Starfire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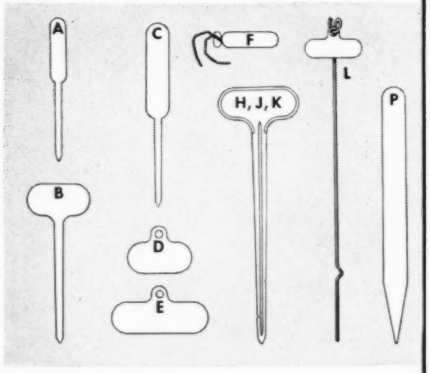

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As a text for a beginning course in horticulture at the college level, it is the reviewer's belief that a book which deals with fundamental principles exclusively (using horticultural crops, as examples) would be more desirable. Within this book there is not sufficient space to discuss the principles of plant growth and their response to environmental factors adequately and to utilize at least half of the text discussing cultural practices of horticultural crops as well. Consequently, those who wish to teach a "survey type" of course in horticulture may be the only ones for whom this text is satisfactory.

F. W. SOUTHWICK
University of Massachusetts
Amherst, Mass.

THE BOOK OF POISONS. Gustav Schenk. 310 pages, indexed. Translated from German by Michael Bullock. Rinehart & Company, New York. 1955 $5.00.

This book is a most complete and erudite exposition of poisons—vegetable, animal and chemical, including the gases. For the gardener, of course, the most interesting—and the most extensive part of the book—is that part dealing with the poisons of plants we grow in our gardens and find in our woodlands and fields.

Mr. Schenk gives interesting pictures of effects of the various kinds of poisons—the first being the cup of hemlock with which Socrates was killed—from the spotted hemlock, *Conim muculatum*, a weed growing by ponds and marshes in many places; wild parsley and celery and carrots belong in this same family, and it might be of interest to note that the hollow stems of the spotted hemlock were used for the "Pipes of Pan".

There are many plants which are both poisonous and beneficial, such as *Colchicum autumnale* whose purple flowers are so beautiful in the fall, yet contain a most deadly poison if taken in any amount, while in minute doses it is still our best medicine for an acute attack of gout. The purple foxglove from which digitalis comes is another similar plant. Then there are the opium poppies whose exudate has been such a boon to mankind, yet has caused such serious addictions. The same could be said of *Coca* and its cocaine derivatives. These and many more of the rarer poisons are very fully described. A whole chapter is devoted to alcohol and another to tobacco, and to the caffeine plants.

The effects of poisonous fungi, such as the mushrooms growing in our immediate vicinities, take up many pages. Everyone knows of the dire effects of eating a toadstool, but few know that small children have died from drinking water in which a bunch of lilies-of-the-valley have been standing.

Then there are the poisons made by industry and the most terrible of all, the chemical warfare agents and those from radioactive material and the atom bomb. All are treated exhaustively and in detail; the book contains a tremendous amount of material for anyone interested in the subject.

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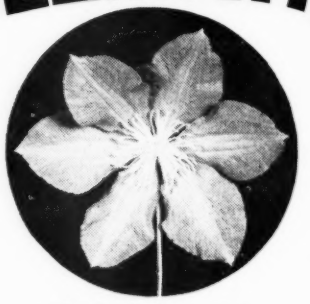

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MICROBIOLOGY. Pelczar, Michael J. Jr., and Roger D. Reid. 564 pages, illustrated, indexed. McGraw-Hill Book Company, New York. 1958 $8.00

Despite the plethora of current textbooks dealing with microbiology, MICROBIOLOGY by M. J. Pelczar and R. D. Reid is a worthwhile addition to the list of recommended college texts. It is designed primarily for undergraduate students taking a general microbiology course; yet sufficient technical data is included so as to make the book valuable as an introductory text for those contemplating a career in microbiology, especially bacteriology.

The textual matter treats primarily of the bacteria, stressing their classification, morphology, reproduction, and chemical abilities; the treatment given the bacteria is extensive and well-done. Lamentably poor, however, are the few pages set aside for microorganisms other than bacteria (the molds, yeasts, viruses, rickettsiae, protozoa, and algae); the coverage is much too superficial and sparse to be of any value. Either more space should have been given to these important organisms or a title less inclusive than MICROBIOLOGY should have been chosen for the book. As it stands now, this is a bacteriological, rather than a microbiological, text.

Special mention should be made of the excellent photographs, drawings, and schematic illustrations provided. Many of the laboratory techniques utilized in microbiological work are effectively presented in this manner.

WILLIAM SILVERMAN

HANDBOOK OF BASIC MICROTECHNIQUE. Peter Gray. 252 pages, illustrated, indexed. McGraw-Hill Book Co., New York. Second ed. 1958. $6

This book is intended to provide college teachers with a text that will "cover the main requirements of undergraduate students in the field of bacteriology, botany, zoology and premedicine and medical technology." It supplements the much larger MICROTOMISTS FORMULARY AND GUIDE published by the same author in 1954.

The first section of three chapters discusses the principles of microscopy and how to use the microscope. Different kinds of microscopes (freshman, medical and research) are described and illustrated with light sources necessary for each. A short chapter deals with photomicrography.

The second and longest section deals in detail with slide making. The beginner will find the descriptions of different types of microscopic slides, and the principles and practice involved in making them clear and straightforward. The mechanical details of how to preserve the materials on different kinds of slides for different biological objects are described, and many illustrations are included. Selected fixatives and stains of proven worth are given for both animal and plant material and their particular uses indicated. Much of this section is applicable to general biology.

The third part of the book consists of detailed examples of how to make a slide of a particular kind. Of the eighteen examples described, nine deal with strictly zoological specimens; one illustrates the smear method applicable to both plant and animal chromosomes; six might be classified as of medical interest (blood, bacteria or parasites); and two of plant anatomy.

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FUNDAMENTALS OF SOIL SCIENCE. C. E. Millar, L. M. Turk, H. D. Foth. 526 pages, illustrated, indexed. John Wiley & Sons, New York. 3rd ed. 1958. $7.75

Rather than a new edition this is more appropriately a third printing of what has been a serviceable book for students of soils. The volume is about sixteen pages larger than previously. There have been a few deletions, some dozen pages added and the original matter given some rearrangement for emphasis on "Soil Development." This is an insertion in Chapter Five. Other than this, the chapter headings remain unchanged.

This book will serve well to introduce the student to the study of soils. It will carry forward in the subject by giving, as it does, much that is practice of agricultural use of soils with some fundamentals of the science of the soil.

WILLIAM A. ALBRECHT, *Chairman*
Dept. of Soils
College of Agriculture
University of Missouri

HANDBOOK OF THE RUBI OF GREAT BRITAIN AND IRELAND. W.C.R. Watson. 274 pages, illustrated (drawings by Ruth M. Ball and A.W. Darnell); indexed. Cambridge University Press, New York. 1958. $12

This posthumous publication treats three hundred and ninety-one "species" of *Rubus* (blackberries and raspberries) occurring in the British Isles. The taxonomic outlook is comparable to that of Liberty Hyde Bailey in his treatments of North American *Rubus*, and the "species" recognized bear little resemblance to species in the ordinary botanical sense. The book is a monument to the patient, untiring efforts of its author, and it may perhaps lay the foundation for a really useful treatment.

ARTHUR CRONQUIST

THE PHYSIOLOGY OF FOREST PLANTS. Edited by Kenneth V. Thimann. 678 pages, illustrated, indexed. Ronald Press, New York. 1958. $12

This book is a summary of the papers and discussions at the First International Symposium on Forest Tree Physiology, which was held at the Harvard Forest in April, 1957.

Trees have not been generally used by plant researchers as experimental material. We have only scratched the surface when it comes to our knowledge about the "inner workings" of trees. This book brings together some of the important knowledge that we already possess, and frequently the discussion following each paper outlines possible methods and means of furthering our understanding on the various topics.

The book is divided into nine parts. Water relations and sap flow in the tree is given a thorough discussion. Foresters charged with planting in areas of light rainfall would be interested in the paper dealing with "Dew Absorption by Conifers."

Silviculturists will find the part dealing with "Photosynthesis of Trees as Affected by Their Environment" an important reference. General biochemistry, mineral nutrition, food translocation, and tree growth are covered by expert researchers. Finally, reproduction information on certain conifers is mentioned. In general, the papers cover the latest developments in tree physiology, much of which up to this time, had not been published.

The book is written on a research level, contains many tables and diagrams, and is "slow" reading but is a book that would be helpful to any practicing forester or nurseryman who has anything to do with *growing* trees. Only by understanding how trees react to their environment can we do our best to prescribe treatment for their maximum development.

AUSTIN N. LENTZ
Extension Forester
Rutgers University

FOREST SOILS. S. A. Wilde, 537 pages, illustrated, indexed. Ronald Press, New York. 1958. $8.50

Although this book was "written to meet the requirements of students of forestry and soils and to be of service to specialists engaged in utilization of forest lands," it is suggested that all growers of plants can achieve a better understanding of the relationships between woody plants and the soils which support them by reading Professor Wilde's treatment of the subject. Many of the soils that gardeners, horticulturists and landscape architects use as a medium for plant propagation were developed in equilibrium with the environment of the forest.

The subject matter is divided into two parts. Part I deals with the formation of soils and considers the fundamental biological, chemical and physical aspects involved in the transformation from geologic rubble to living soil. Of particular interest is the geographic discussion of soil-forest types in which the universal relationships of forest vegetation to soils is demonstrated in comparable climatic regions in America, Europe and Asia.

Part II is perhaps of more direct interest to horticulturists since it is concerned with the practical aspects of soil management. This is particularly true of Chapters 11, 12 and 13 where nursery soil management, adjustment of nursery soil fertility and control of parasitic organisms and noxious weeds are discussed.

The book is well illustrated and the quality of the writing reflects the broad scientific and literary background of the author.

V. K. VOIGT
Asst. Prof. Forest Soils
Yale University

Omission Corrected: Inadvertently a footnote was omitted from the article on "Re-creation of A Species" by David G. Leach which appeared in the January-February, 1959 issue of The Garden Journal of The New York Botanical Garden. The footnote read: "This was originally written for the Bulletin of The American Rhododendron Society; then several sections were rewritten to direct it towards a more general audience".

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It is from the series, "The Pleasures of Life in the Country", and is captioned: "Oh, well, my friend . . . it can't be said we have any flowers this year at our country place, so here is a rose bud I brought you from Paris."

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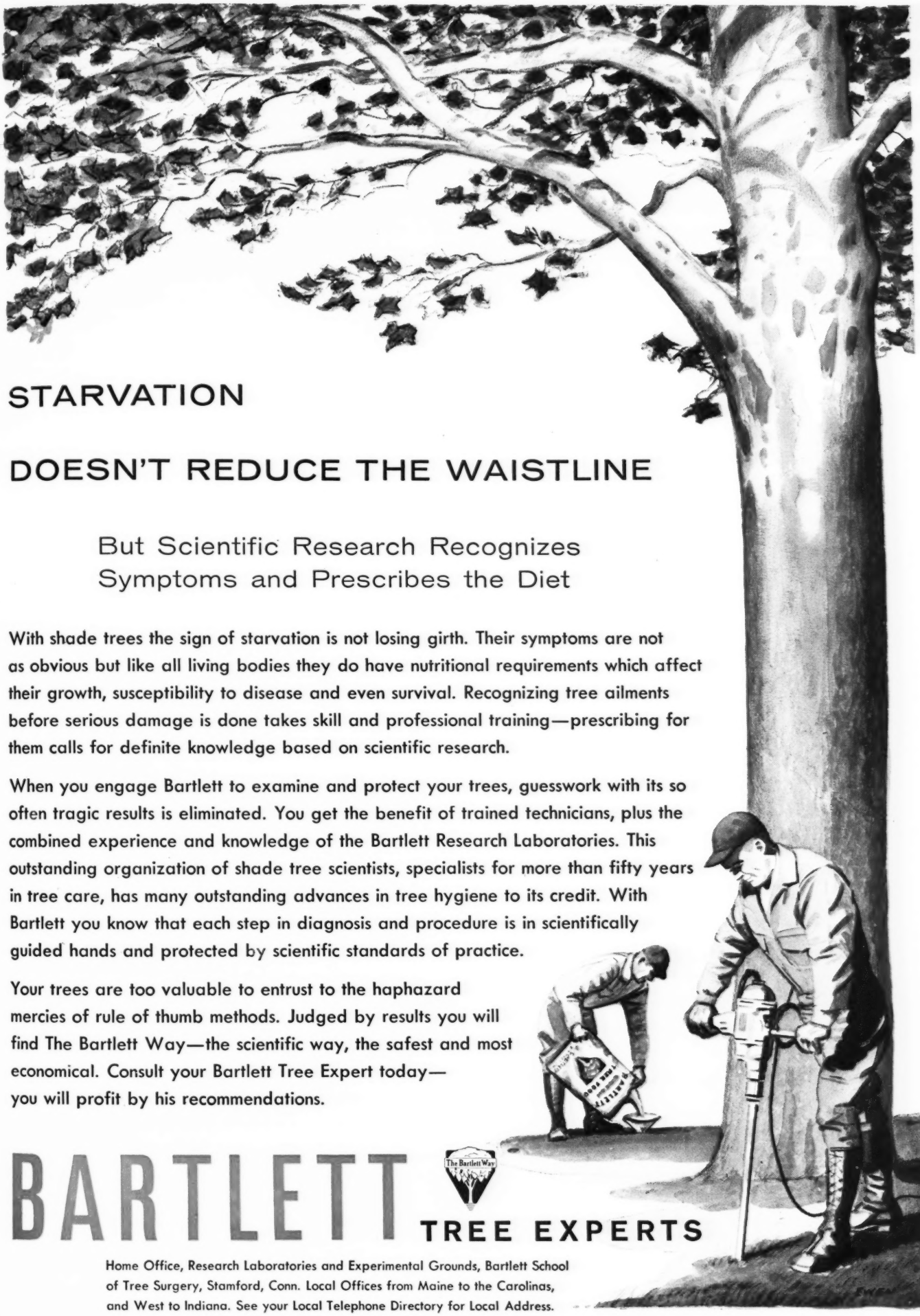

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